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NEW KNOWLEDGE OF MALARIA GAINED FROM ITS THERAPEUTIC USE IN GENERAL PARALYSIS.

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The two methods of producing infection.—For the treatment of general paralysis malaria has been conveyed in one of two ways: (i) by injection—subcutaneous, intramuscular or intravenous—of the blood of an individual containing malaria parasites, generally *Plasmodium vivax*; (ii) in the natural manner by the "bites" of mosquitoes, usually *Anopheles maculipennis*, which have deliberately been infected by feeding on malaria cases showing gametocytes in the cutaneous blood. The terms "injected" and "natural" are used below to indicate these two conditions.

Although LEY (1924) compares an injection to an immense mosquito bite, there is much to indicate that this is by no means the case; that these two methods are indeed sufficiently distinct to necessitate caution in transferring inductions, made upon injected, to natural cases.

For example: In injected infections disinfestation is extraordinarily easy. To effect complete cure, sometimes clinical, sometimes checked by microscopic examination, the amount of quinine which has been administered has varied from 10 grammes (DOERR and KIRSCHNER (1921)) to 3–5 grammes (MÜHLENS and KIRSCHBAUM (1924)), while REDLICH (1924)) has felt it sufficiently noteworthy to record that he observed a relapse after 5 grammes. Warrington YORKE noted relapse in 2 per cent. of injected cases treated with 6 grammes of quinine (2 grammes on three successive days). On the other hand, after natural infection the work of Warrington YORKE and MACFIE (1924), again reported upon by Warrington YORKE (1925), showed a relapse rate of 57 per cent. with the same dosage. Whether DAVIDSON's cases (1925) are included in YORKE's is not clear. He experienced 3·3 per cent. of relapses after injection and 56 after natural infection.

Clearly infections acquired as sporozoits react in this respect differently to those received as trophozoits, and there would seem to

be no justification for assuming, without evidence, that inductions from infected can be transferred to natural cases. The two classes should then be separately considered.

The incubation period of injected cases has lain between 5 and 31 days. It has differed, too, with the tissue-site of injection. For example, REESE and PETER (1924) found it to vary from 5 to 8 days in intravenous injection, and from 10 to 25 days with subcutaneous injection. For the same methods DATTNER and KAUDER (1924) experienced periods of 4 to 7, and of 6 to 10 days, while for scarification with application of the blood—a normal vaccination technique apparently—the periods lay between 10 and 16 days. These times may presumably be correlated with the number of parasites which reach the circulation in these methods, although two patients inoculated at the same time with the same quantity of the same blood may have quite different incubation periods (MÜHLENS and KIRSCHBAUM (1924)).

Morphology and life history.—In inaugurating a strain of *P. vivax*, MÜHLENS issues the gravest warning as to the care essential to ascertain, by daily examination of the blood, that it is pure. For lack of this a number of deaths have occurred from unsuspected contamination with *P. falciparum*, and it may be added that when deliberately using *P. falciparum*, and making daily examinations of the blood by way of apparently adequate safeguard, there have nevertheless been deaths from fulminating cerebral malaria (YORKE & MACFIE (1924)). But when a pure strain of *P. vivax* has been established it has been maintained for years, whether transmitted by injection or naturally, and has throughout retained the morphological characters of *P. vivax*, irrespective of season. The unicity theory has broken down completely at the first experimental test.

There has been a curious diversity of experience regarding the formation of gametocytes. For instance, a Palestinian strain of PLEHN'S (1925) ran through 20 passages, covering two years, without gametocytes, and then began to show them. Gametocytes are held by many to be indicative of relapse (ZIEMANN (1924)), whereas Warrington YORKE and MACFIE have observed that although the first forms to appear are nearly always trophozoits, yet in all cases gametocytes made their appearance in the peripheral blood two or three days later. The gametocyte may then in primary mosquito infection appear very early, may on occasion be the first form discovered in the cutaneous blood, an observation confirmed by STEPHENS and by Gordon THOMSON (1924). It would seem that this early appearance of gametocytes in first infections should be correlated with THOMSON'S observations that a hundred adult Rhodesian negroes showed complete absence of crescents, while these were present in 40 per cent. of their children.

Again, Warrington YORKE and MACFIE noted that gametocytes, present in the thirty-fifth, fortieth and forty-first injected passages, exflagellated and developed to oocysts in *A. maculipennis*. The observation of sporozoits was unfortunately prevented by the deaths of the mosquitoes. Similarly, MÜHLENS and KIRSCHBAUM (1924) report the formation of gametocytes in all strains of all three species of parasite transmitted by injection, and ready exflagellation after the fortieth direct transfer. There is then no possible justification for the conclusion of BARZILAI-VIVALDI and KAUDERS (1924) that directly injected cases are no risk to anyone anywhere.

Regarding other forms and stages, MÜHLENS and KIRSCHBAUM note that in subtertian cases "tenue" forms have been found in

many smears. PLEHN notes, regarding the hitherto gametocyte-free strain mentioned above, that at the time when gametocytes appeared it changed from a small parasite, segmenting when about half filling the erythrocyte, to one having ordinary tertian characters.

WEBER (1923) notes that in MÜHLENS and KIRSCHBAUM'S work, infection never followed injection of blood which contained gametocytes only, so that the "parthenogenesis" which is now accepted by the French authorities, with no evidence offered, appears to have no experimental basis.

The clinical reaction.—The same strain of *P. vivax*, passed on by injection, may vary in the extent of the bodily reaction induced in the host. It may be held to require "refreshing" or become extraordinarily virulent, so that MCBRIDE and TEMPLETON report three deaths in 18 cases; but it appears that, observed over a sufficiently long period, no fundamental alteration in virulence is to be detected (GERSTMANN (1923)). Nevertheless the mortality sufficiently emphasizes the need for daily observation of the blood, even with *P. vivax* infection, where the host is debilitated.

Quinine.—The different action of quinine on early injected and early natural malaria has been noted. It is concluded that the results of treatment of injected cases do not indicate directly its value in natural infections. Yet, although the results of treatment on early natural do not equal those on early injected cases, they are yet an enormous improvement on those attained during the Great War in the same hands, but in repatriated soldiers and, therefore, established cases; and they indicate the vital importance of immediate and adequate treatment, checked by microscopic examination, of all early malarial infections.

As a prophylactic, YORKE and MACFIE noted that 10 grains of quinine taken daily for 5 days before and 7 days after the individual had furnished a meal to an infective mosquito failed to prevent infection. This could only be ensured by continuing this quantity of quinine for 10 days after furnishing the infective feed. Against the sporozoit, then, quinine is apparently ineffective, and of little or no prophylactic worth unless taken in curative doses, a conclusion which confirms HANSCHELL'S African observations (1924).

The direct action of quinine upon plasmodia is negatived by the observation of MÜHLENS and KIRSCHBAUM that blood may be mixed with a solution of quinine hydrochloride (so that its strength is 1 in 10,000), left for 12 hours, and may yet infect the paralytic into which it is injected; and that if the strength be 1 in 5,000, it may lie in this solution for 5 hours and yet infect. Warrington YORKE, and WEBER (1923) have severally confirmed this. The latter notes that quinine given to a donor does not render his blood malarially harmless to the recipient; while, regarding tertian gametocytes, MÜHLENS and KIRSCHBAUM infected *A. maculipennis* in winter with *P. vivax* by feeding on a malarial subject who was taking quinine.

Immunity and tolerance. It has frequently occurred that an injection of malarial blood containing *P. vivax* has failed to produce evident infection (WAGNER-JAUREGG (1922); GRANT and SILVERSTON (1924); Warrington YORKE and MACFIE (1924)). Most persons, however, became infected after repetition of the injection. In the hands of the last named, infective mosquitoes never failed to produce infection,

A. bifurcatus as readily as *A. maculipennis*. It may well be, however, that in some of these cases recalcitrant to injected infection, this has actually occurred, has remained latent, and has been made evident by some other factor. Such was perhaps the case in one of YORKE and MACFIE's patients, in whom, *P. malariae* infection not showing by the 39th day, infection with *P. vivax* was undertaken. The quartan plasmodia showed themselves five, and the tertian fifteen days after the second injection. Spontaneous disappearance of parasites and fever has not infrequently nullified the hopes of benefiting the paralytic, since betterment is dependent on the occurrence of a series of heavy attacks. Particularly does this seem to have been the case where there has been previous malaria.

The method of cure of malaria.—The failure of quinine to destroy parasites, when incubated with blood at body temperature and at a strength far in excess of any hitherto found *in vivo*, indicated that it is not quinine which sterilizes. It has been suggested (LIPKIN (1919)) that some plasmodicidal metabolite is formed from quinine. The objection that none has been found does not, in our present state of ignorance, appear cogent. Warrington YORKE and MACFIE hold it reasonable to conclude from their findings that quinine given to one whose blood contains numerous malaria parasites, destroys directly, or more probably indirectly, large numbers but not all of the parasites, thus setting free a considerable quantity of soluble antigen. The antigen provokes, by stimulation of the host's tissues, the formation of immune body. The immune body, if present in sufficient amount, destroys the remaining parasites, thus resulting in sterilization of the infection and cure of the patient.

Regarding *other malarial phenomena* (HERRMANN (1924)) malarial amblyopia was cured by quinine, and gangrene of the toes, initiated by malaria injected into a tabetic, was stopped by quinine administration. PIJPER and RUSSELL (1924) found that after injection of benign tertian malaria, the red blood corpuscles increase by 10 to 30 per cent. before fever appears, and that fever can be cut out by the injection of neosalvarsan.

References.

BARZILAI-VIVALDI & KAUDERS (1924)—*Wien. Klin. Woch*, xxxvii. 1055–1057. [*T.D.B.*, xxii, 56.]

DATTNER & KAUDERS (1924).—Klinische und experimentelle Studien zur therapeutischen Impf-Malaria. Leipzig & Vienna: Deuticke, 39 pp. [*T.D.B.*, xxi, 614.]

DAVIDSON (1925).—*Jl. Mental Science*, lxxi, 486–490. [*T.D.B.*, xxiii, 148.]

DOERR & KIRSCHNER (1921).—*Ztschr. f. Hyg. u. Infektionskr.*, xcii, 279–290. [*T.D.B.*, xix, 298.]

GERSTMANN (1923).—*Ztschr. f. d. ges. Neurol. u. Psychiat.*, lxxxi, 255–262. [*T.D.B.*, xxi, 615.]

GRANT & SILVERSTON (1924).—*Jl. Mental Science*, lxx, 81–89. [*T.D.B.*, xxii, 53.]

HANSCHELL (1924).—*Trans. Roy. Soc. Trop. Med. & Hyg.*, xviii, 57–62. [*T.D.B.*, xxii, 60.]

HERRMANN (1924).—*Med. Klin.*, xx, 445–448. [*T.D.B.*, xxi, 614.]

LEY (1924).—*Bruxelles-Méd.*, v, 1–3. [*T.D.B.*, xxii, 56.]

LIPKIN (1919).—*Ann. Trop. Med. & Parasit.*, xix, 149–176. [*T.D.B.*, xxi, 854.]

MÜHLENS & KIRSCHBAUM (1924).—*Arch. f. Schiffs- u. Trop.-Hyg.*, xxviii, 131–144. [*T.D.B.*, xxi, 613.]

PIJPER & RUSSELL (1924).—*Brit. Med. Jl.*, 1924, Oct. 4, 620–621. [*T.D.B.*, xxii, 54.]

PLEHN (1925).—*Arch. f. Schiffs- u. Trop.-Hyg.*, xxix, 56–65. [*T.D.B.*, xxii, 408.]

REDLICH (1924).—*Wien. Klin. Woch.*, xxxvii, 134–138. [*T.D.B.*, xxi, 615.]

REESE & PETER (1924).—*Med. Klin.*, xx, 372–376; 410–412. [*T.D.B.*, xxii, 55.]

STEPHENS (1924).—*Proc. Internat. Conference on Health Problems in Trop. America*, 70–71. [*T.D.B.*, xxii, 395.]

THOMSON (1924).—*Proc. Internat. Conference on Health Problems in Trop. America*, 80–81. [*T.D.B.*, xxii, 395.]

WAGNER-JAUREGG (1922).—*Jl. Nervous & Mental Dis.*, lv, 369–375. [*T.D.B.*, xx, 973.]

WEBER (1923).—*Geneesk. Tijdschr. v. Nederl.-Indië.*, lxiii, 234–238. [*T.D.B.*, xx, 974.]

YORKE (1925).—*Trans. Roy. Soc. Trop. Med. & Hyg.*, xix, 108–122. [*T.D.B.*, xxiii, 148.]

—— & MACFIE (1924).—*Trans. Roy. Soc. Trop. Med. & Hyg.*, xviii, 13–33. [*T.D.B.*, xxii, 50.]

ZIEMANN (1924).—Mense's Handbuch der Tropenkrankheiten, 3te Auflage, Band 3, xiv+592. [*T.D.B.*, xxii, 338.]

BERIBERI.

FUJINAMI (Akira). **Historical Reviews of the Study on Beri-Beri in Japan.**—*Japan Med. World.* 1925. Nov. 15. Vol. 5. No. 11. pp. 314–317.

The author reviews shortly the scientific work done on beriberi in Japan from the 18th century to the present time. He concludes that from the fact that the etiology of the disease is generally of a compound nature and the causative factors are more or less relative in their interaction it seems clear that further investigations are necessary in order to get fuller light on the important subject of kakke. Who can say that the theories of intoxication and infection have entirely failed ? While the results of past investigations have greatly advanced our knowledge, yet they do not leave us satisfied with the present situation. There must be the fullest cooperation between all workers if our labours are to be successful.

P. W. Bassett-Smith.

VERVOORT (H.). Het vraagstuk der beri-beri bestrijding op het a.s. congres te Tokio. [**The Problem of combating Beriberi at the Coming Congress at Tokio.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 5. pp. 599–607.

The Congress of the F.E.A.T.M. at Singapore in 1923 decided to investigate the possibility of prevention of beriberi by legal regulations concerning the polishing of trade rice.

Vervoort states that experience on the East Coast of Sumatra has sufficiently shown the relation between beriberi and the consumption of polished rice. A table shows how the difficulties of rice importation during the war increased the beriberi mortality. From data supplied by the local Trade Association he calculates that apart from the indentured imported labour force on the estates of Sumatra's East Coast, only one-tenth of the native population is using imported rice (which constitutes the only practical menace in this respect). This part of the population, however, is living at or near the more important towns of the island, where the medical survey is trustworthy, and shows that beriberi is comparatively rare.

The East Coast of Sumatra Section of the Medical Association of the Dutch East Indies accepted the following conclusions :—

(1) On Sumatra legal regulations concerning trade rice could only be applied to imported rice.

(2) The rice import of Sumatra is concentrated in the East Coast district where, apart from the estate labourers, about half of the population is compelled to use imported rice.

(3) Accordingly, legal measures would chiefly concern the East Coast of Sumatra.

(4) The medical control of the estate labourers there is sufficient to prevent epidemics of beriberi, and beriberi is too rare in the rest of the population to justify far-reaching measures.

(5) Gradual education of the natives on the causes of beriberi may be considered sufficient for combating the disease.

W. J. Bais.

BERNARD (P. Noël) & LAMBERT (André). Recherches sur le béribéri. [**Researches on Beriberi.**]—*Arch. Insts. Pasteur d'Indochine.* 1925. Oct. No. 2. pp. 153–188. [4 refs.]

The 5th Congress of the Far East Association of Tropical Medicine, held at Singapore in September, 1923 [not 1925, as stated], passed a resolution on the subject of beriberi in which interested Governments were invited to initiate fresh research on the standardization of rice and the effects of its transport and storage. As a result the Governor of Cochinchina nominated a committee of 11 persons, 5 of them chemists, with Dr. Bernard as president, with instructions to prosecute research on beriberi in its relations with a rice dietary. The report, which is here published, is composed of 4 parts, a chemical, a biological and medical, conclusions and appendices, and well merits perusal. The conclusions alone can be given.

The nutritive portions of a complete grain of rice, apart from starch and protein, are found in the embryo and integument. Factory manipulation, which is necessary for the preservation of rice intended for food, removes both integument and embryo. All the kinds of rice so treated have a similar composition and none contains the ·5 per cent. of P_2O_5 laid down by previous Congresses as the essential minimum. The authors ask whether this is the case in other rice-producing countries. If so, the standardization of rice resolves itself into the determination of the degree of cleaning which leaves a rice with 500 mgm. of P_2O_5, a rice also that will keep and will be accepted by the consumers. To contain this proportion the greater part of the germ and integument must be left adherent. But the keeping qualities of stocks of such rice are recognized to be very uncertain. Moreover, rice decorticated by pounding by the very poor, i.e., with the minimum of cleaning compatible with the taste of the least exacting consumers, does not reach the proportion of ·4 per cent. P_2O_5. The authors ask whether a rice with a larger content would not have such a taste as to ensure its rejection. The Singapore Conference proposed to call rice containing ·5 per cent. P_2O_5 "standard rice" and rice containing a smaller proportion "polished rice." According to the authors these appellations do not correspond with reality and are inaccurate.

There are two factors, humidity and heat, which lead to changes in transported and stored rice. To preserve incompletely cleaned rice it must be kept in a state of fairly strict dryness (dyshydration). This could be ensured as it comes from the factory, but not, in the tropics, when masses of rice are exposed to repeated transshipments, carriage in the holds of ships, exposure in shops, etc.

The measures proposed by several F.E.A.T.M. congresses depend on so many variable and indefinable factors that they are impracticable. The first step should be the fixing of a common method of chemical analysis in the Far Eastern countries, such as is given at the end of the report.

The Committee take note of (a retenu) Dr. Noël Bernard's conception of beriberi as a toxic infectious disease due to *Bacillus asthenogenes.*

They plead for renewed clinical studies of beriberi under various conditions, supported by laboratory research, including an enquiry into its single or multiple origin.

It is admited by all that the addition of rice bran to white rice is the essential prophylactic measure. The Congress would accomplish this by the preparation of a standard rice incompletely decorticated,

the Committee by a different method. The bran, an essential product for the physiologic needs of man, is rejected by the rice factory as a by-product of secondary value. Immediately after its production it undergoes changes induced by the humidity in which fatty acids are liberated. The problem then is to find (1) an industrial process capable of dehydrating the bran and freeing it from fat so as to produce at a moderate price a flour which will keep ; (2) a way of putting up this flour in liquid or solid form so as to furnish the peoples with a cheap food which they can add to their rice. The richest part of the grain would thus be recovered and used for the nutrition of man.

A. G. B.

DE LANGEN (C. D.). Rapport omtrent het beri-beri vraagstuk, in verband met een mogelijke internationale regeling ten opzichte van het pellen der rijst, (op het congres te Tokyo uitgebracht). [**Report on the Beriberi Question : a Possible International Regulation as Regards the Milling of Rice (delivered at the Congress at Tokyo).**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 6. pp. 788–815.

In view of the resolutions on the beriberi question, accepted by the 5th Congress at Singapore in 1923, the author gives a complete review of this question in the Dutch East Indies. The discordancy in the literature of the last few years concerning the causes of beriberi, which is again ascribed by various authors to toxic and infectious factors, is caused, according to de Langen, by the fact that many cases, and even epidemics, of polyneuritis are considered to be beriberi, which actually are toxic or infectious or mixed polyneuritis of other origin. Real beriberi is the B-avitaminosis in people whose staple food consists of carbohydrates, especially rice. At Weltevreden 40 per cent. of polyneuritis cases had to be ascribed to other causes than beriberi. If polyneuritis is combined with dropsy it is very likely to be beriberi ; in the so-called dry cases the differential diagnosis may be difficult. In real beriberi the deficiency theory gives the only satisfactory explanation, satisfactory, too, from the possibility it offers of a reasonable and effective treatment.

The rice position in the Dutch East Indies is such that to cover its needs the country has to import a quantity of rice of 500,000–600,000 tons, or approximately 12 per cent. of its own rice production. Only sparsely populated countries with large areas suitable for irrigation can produce in quantities allowing export.

In Java beriberi is practically limited to the towns and the agricultural and industrial centres, where—at least during certain parts of the year—the people are compelled to use imported rice. The imported rice, exposed to the risk of spoiling by a longer transport, is polished to a further degree than the inland rice to render it more durable. Rice cannot be kept for long periods of time without danger of getting bad except in the unhusked state (gaba) or completely polished. Insects can be kept away from milled unpolished rice by chloroform or carbon tetrachloride vapour, but this meets with difficulties in practice. For standardization of rice in view of its vitamin contents neither the determination of the phosphorus content (which is discussed in detail) nor the spirit test nor the biologic method responds to the needs of practical life.

Unpolished rice is unsuitable for international trade ; polished rice exposes the consumer to the dangers of beriberi. Therefore, the author thinks that rice should be imported only as gaba (i.e., unhusked), and subsequently handled by local mills where polishing can be done according to the requirements of the market and to any desired degree. Laws could provide for such a regulation and the author thinks that it would not materially interfere with the price of the article. [The economic consequences should be considered more closely, in the annotator's opinion, before far-reaching measures like this are decided upon.]

The use of rice bran made into bread or otherwise for the prophylaxis of beriberi does not seem to have a great scope.

As for the educational campaign against the disease, the author emphasizes the difficulties met with by mentioning an epidemic in a boarding house where meals were taken by several native medical students, all aware of the menace brought upon them by the diet.

W. J. Bais.

GRÄFF (Siegfried). Beriberi und ihre Beziehung zur experimentellen Avitaminose. [**Beriberi. Its Relation to Experimental Avitaminosis.**]—*Med. Klin.* 1925. July 24 & 31. Vol. 21. Nos. 30 & 31. pp. 1112–1114 ; 1152–1155. [22 refs.]

The author gives a long historical résumé of food deficiency diseases and full details of the morbid anatomy and pathological changes ; he finds in these no scientific evidence for any definite theory of origin. It is most difficult to separate the results of starvation from those of avitaminosis. He repeatedly emphasizes the conclusions of OGATA that lack of vitamin B is not the only factor in beriberi, but that the internal glands and changes in the intestinal canal are of great importance ; though there is no definite proof of a causative toxin there is much in its favour, especially in oedematous cases. He states that " before beriberi can be regarded as an avitaminosis it is necessary to show that all cases of epidemic beriberi must without exception be attributable to a lack of vitamin B ; this evidence we have not yet obtained for infection cannot be entirely ruled out." The value of vitamin B as a curative agent in man and animals may admit of other explanations. [The whole paper is argumentative, contains no new facts and does not appreciably advance our knowledge.]

P. W. B–S.

TRABAUD (J. P. R.). Une petite épidémie de béribéri à forme sèche à Beyrouth. [**A Small Epidemic of Dry Beriberi at Beyrouth.**]—*Arch. Méd. et Pharm. Milit.* 1925. Sept. Vol. 83. No. 3. pp. 270–276.

——. État actuel de nos connaisances sur le béribéri à propos de la relation d'une épidémie de cette maladie observée récemment en Syrie.—*Ibid.* pp. 277–286.

Five cases of beriberi were received into the hospital at Beyrouth in the summer of 1924 in Annamites of a battalion of Indo-Chinese who had left their country more than a year before. The disease was mild and of the dry variety. The polished rice diet was the cause, taken in excess and associated with heavy work. When placed upon hospital diet they very quickly recovered. At Alexandretta there were

two fatal cases and the author thinks that this may be an endemic centre. He quotes an instance of the disease appearing among a native detachment one month after arrival at Beyrouth after a long sea voyage with a marked deficiency diet. When once the disease was noted there were many cases, but much less severe than at Aleppo and Alexandretta. He notes that an experienced Commandant reduced the 500 grams of rice to 299 gm. and replaced the deficit by fruit and vegetables ; it is the reduction of quantity and not total suppression that is required. Gardens were encouraged.

P. W. B–S.

PONSFORD (F. W. A.). **Beri-Beri at Thursday Island.**—*Health.* Melbourne. 1925. Nov. Vol. 3. No. 6. pp. 181–183.

The incidence of beriberi at Thursday Island according to the statistics of the Torres Strait Hospital for the years 1923, 1924 and part of 1925 is given and an interesting table shows the amount of the disease in the different races and classes.

During 1924, among the 350 islanders employed in diving, there was only one case. The Filippinos, Japanese and Malays suffered most. The total cases during the year were 97, with 4 deaths, and the financial loss to the island is put down as over £3,000. It is suggested that the disease has been less severe during recent years as compared with the period 1911–1922 reported on by Dr. METCALFE.

P. W. B–S.

BABLET (J.) & GUILLERM (J.). Les troubles du métabolisme de l'azote et du chlore dans le béribéri sec. [**Disorders of Metabolism of Nitrogen and Chlorine in Dry and Wet Beriberi.**]—*Bull. Soc. Path. Exot.* 1925. Nov. 11. Vol. 18. No. 9. pp. 735–736.

—— & ——. Les troubles du métabolisme de l'azote et du chlore dans le béribéri humide.—*Ibid.* pp. 739–742.

It was found from a study of the blood, cerebro-spinal fluid and urine of cases of beriberi that there was a general retention of chlorides in the body, a deficient metabolism of nitrogenous substances and an acidosis which was more marked in the wet than in the dry form. The details of the analyses of 8 cases of the latter and 9 of the former are given in the form of tables. It is pointed out that the study of the metabolism of sodium, calcium, phosphorus, sugar and cholesterin, with the changes in the reserve alkalinity during the course of the illness, will give useful information on the functional efficiency of different organs.

P. W. B–S.

HELLER (V. G.), MCELROY (C. H.) & GARLOCK (Bertha). **The Effect of the Bacterial Flora on the Biological Test for Vitamin B.**—*Jl. Biol. Chem.* 1925. Aug. Vol. 65. No. 1. pp. 255–264. With 3 charts. [10 refs.]

The work of STEENBACK, SILL & NELSON is quoted as showing the unreliability of many rat tests for vitamin B. One of three theories may account for this—(1) The vitamin in the food is only partially used ; (2) the vitamin is a catalytic substance not destroyed by digestion and therefore capable of acting time after time ; (3) the bacteria

in the intestine synthesize vitamin B and store it within their own bodies. *B. phlei*, *B. smegmatis*, *B. moelleri*, perhaps *B. coli com.* and others are believed to do this. The third theory is the subject of the present study. Experiments are described and curves given of the rats used. The following conclusions were reached :—

"1. Experimental animals kept under the usual laboratory conditions do not respond as quickly to vitamin-free rations as do those given the same ration and placed upon screens.

"2. Feces fed to animals that have ceased to grow on the experimental ration will produce an accelerated growth.

"3. The spore-bearing organisms present in the intestinal tract during the early part of the experiment synthesize and store vitamin B.

"4. Animals kept on pans so they have access to their feces have greater numbers of these spore-bearing organisms during the early part of the experiment because of the reingestion of these organisms. The continued growth of these animals is undoubtedly due to the additional vitamin B which has been synthesized and stored by these spore-bearing organisms. [The organism has not been determined and proof appears inconclusive.]

"5. Animals given roughage in some form make a better growth than those without this material. This is especially true when agar-agar is incorporated in the ration.

"6. Extracts of the various forms of roughage used indicate that the substances contain no vitamin, but the added bulk produces a better physical condition in the animal."

P. W. B–S.

SALMON (W. D.). **Vitamin B in the Excreta of Rats on a Diet Low in this Factor.**—*Jl. Biol. Chem.* 1925. Sept. Vol. 65. No. 2. pp. 457–462. With 3 text figs. [3 refs.]

STEENBACK, SILL & NELSON have shown that the consumption by rats of their own excreta led to errors in the determination of vitamin B. The author therefore carried out experiments of which charts are given which show that the faeces of the rats may be rich in vitamin B even when the diet is low in this factor, and that the excreta contained more vitamin B than did the corn and oats of the basal diet. This was not due to the growth of moulds on the faeces, and the reason is not clear. His conclusions were in accordance with the above-mentioned authors.

P. W. B–S.

PILCHER (J. D.) & SOLLMANN (Torald). **Deficient and Surplus Consumption of Vitamin B : their Quantitative Relation to Weight-Changes, and to Vitamin Storage, in Adult Pigeons.**—*Jl. Pharm. & Experim. Therap.* 1925. Oct. Vol. 26. No. 3. pp. 203–213. With 4 text figs. [3 refs.]

Working with pigeons of an average weight of 375 gm. kept in metal cages and given yeast extract in gelatine capsules in amounts varying from 19 to 960 mgm. daily, the authors found that the loss of weight bore an inverse proportion to the daily dosage of the yeast extract. The weight curve does not vary whether the experiment follows a period of deficiency B diet or full maintenance of the yeast. If a surplus of yeast has been given before, then the loss of weight may be delayed for a week ; that is, a week's supply can be stored up. The same results were found when a corn diet was used. The authors

find that the liability to neuritis is apparently an individual trait, for pigeons that showed neuritis on the first experiment with rice and were cured with corn, again developed neuritis when subjected to the rice diet.

P. W. B–S.

COLLAZO (J. A.) & FUNK (Kazimierz). Przemiana witaminy B, jako jednego ze składników pozywienia, i wydzielanie jej u gołebi. **The Metabolism of Vitamine B as one of the Food Constituents, its Excretion in the Pigeon.**—*Medycyna Doswiadczalna i Społeczna.* Warsaw. 1924. Vol. 3. No. 5–6. pp. 359–365. English summary pp. 365–366. [12 refs.]

Vitamin B only appears in the excreta of pigeons when 3–4 times the maintenance dose of this substance is given. The vitamin, therefore, cannot act as a catalyst but actually enters into the processes of metabolism and is used up therein. The stools of pigeons suffering from vitamin B deficiency are of a green colour. The authors regard this as a safe sign of the defect.

A. D. Bigland.

LEVENE (P. A.) & VAN DER HOEVEN (B. J. C.). **The Concentration of Vitamin B. II.**—*Jl. Biol. Chem.* 1925. Sept. Vol. 65. No. 2. pp. 483–489. [2 refs.]

This is a continuation of their previous work to improve the preparation of vitamin B from brewer's yeast. The chemical details must be read in the original, but they were able further to concentrate the yeast extract and from the product a material was obtained which is active in daily doses of 0·600 mgm. and contains only 4 per cent. of nitrogen.

P. W. B–S.

CHAHOVITCH (X.). Action de l'insuline sur le béribéri expérimental du pigeon. [**Action of Insulin on Experimental Beriberi in Pigeons.**] —*C. R. Soc. Biol.* 1925. Nov. 27. Vol. 93. No. 34. pp. 1333–1335. [2 refs.]

FUNK has shown in experiments on pigeons that vitamin B plays an important part in the utilization of sugars. The author carried out a number of experiments with pigeons, showing symptoms of polyneuritis, by giving varying doses of insulin. In the treated pigeons he found that the loss of weight was slower than in the control birds, evolution of the symptoms was retarded and the reduction of the temperature was less marked.

P. W. B–S.

BACCARANI (Umberto). Azione della vitamina B sul ricambio minerale (fissazione del calcio). [**Action of Vitamin B on Mineral Exchange (Calcium Fixation).**]—*Riforma Med.* 1925. July 6. Vol. 41. No. 27. pp. 625–627. With 2 charts in text.

The therapeutic effects of mineral salts, those of calcium in particular, are greatly enhanced by their administration in a "live"

form, that is, as food rich in the salt, for example, *Cichorium endivia*, a vegetable in common use, and containing a large proportion of minerals, 180 gm. of ash in 1,000 gm. of the dried substance.

The vitamin B acts by fixing or bringing about the retention of calcium in the body. The output of Ca in the urine of 9 patients was estimated before they underwent any treatment. To 6 was then given a mixture containing carbonate and phosphate of calcium; to the other three chloride of Ca only, in syrup and water. After three days of this treatment the patients were given the same, but "in a vitaminized vehicle (vitamin B)." The average results of the analyses were: (1) Before administration of Ca there was 0·336 gm. of Ca in the daily output of urine; (2) during the simple Ca treatment in the first group the average was 0·529 gm., in the second, 0·637 gm. (3) With the vitaminized calcium, in the first group 0·394 gm., and in the second, 0·431 gm. Thus the simultaneous administration of the vitamin B led to retention of the calcium. This was confirmed by estimation of the blood-calcium. Those having the simple calcium mixture showed 0·0982, those with the "polycalcium" mixture 0·0983 gm.; after three days of the vitaminized polycalcium mixture 0·0989 gm. per 1,000.

H. Harold Scott.

Bowman (H. H. M.) & Yee (Martin A.). **Crystals of Vitamin B from the Mung Bean.**—*Proc. Soc. Experim. Biol. & Med.* 1925. Jan. Vol. 22. pp. 228–231. With 3 figs.

By a complicated chemical procedure crystals, claimed by the authors to be those of vitamin B, were isolated from a Chinese bean known as the Mung bean. The crystals, of which a micro-photograph is given, did not respond to tests for uric acid, amino acids or proteins. Intramuscular injection of the product into pigeons in 3 mgm. doses relieved the acute symptoms of polyneuritis within an hour. Further experiments were made with adult pigeons fed on a restricted diet. To two of the birds intramuscular injections of 3 mgm. of a solution of the crystals were given at three-day intervals; two more birds were kept as controls. All the birds showed a gradual decline in weight, but after the injections a temporary gain was noted owing to renewal of appetite and consequent increase in feeding. [It is not quite clear exactly what the authors hoped to prove by this second experiment. Presumably they have shown that the crystals are not as effective in prophylaxis as they are in therapeusis.]

Experiments were tried in guineapigs, but the advent of scurvy in these animals complicated the result.

A. D. Bigland.

i. Ohhira (Koh). **On the Basal Metabolism in Beriberi, especially in B. Avitaminosis.**]—*Chugai Iji Shimpo* (*Cent. Med. Jl.*). 1925. June. Vol. 44. No. 11. [Summarized in *Japan Med. World.* 1925. Aug. 15. Vol. 5. No. 8. pp. 217–218.]

ii. Higuchi (Sakaye). **On Beriberi-Like Disease of the Chicken and Monkeys by the Feeding with a Species of** *Bacillus Subtilis*.—*Saikingaku Zasshi* (*Jl. of Bact.*). 1925. Apr. No. 350. [*J.M.W.* Nov. 15. No. 11. pp. 323–324.]

iii. Ito (Washimi). **A Contribution to the Knowledge of the Blood of Beriberic Cases and of the Pigeon suffering from Polished Rice Disease.**] —*Tohoku Igakkwai Zasshi* (*Jl. Tohoku Med. Soc.*). 1925. May. Vol. 8. No. 2. [*J.M.W.* Dec. 15. No. 12. pp. 362–363.]

iv. Ohhira (Akira). **On the CO_2 Diagram of the Blood in Beriberi and B. Avitaminosis.**]—*Ibid.* [*J.M.W.* pp. 362–363.]

v. Ariga (Junzaburo). **On Beriberi Edema on the View Point of Hypophosphoric Sodium Excretion. Studies on Beriberic Edema. Communication 1.**]—*Hokuetsu Igakkwai Zasshi.* (*Jl. Hokuetsu Med. Soc.*). 1925. June. Vol. 14. No. 3. [*J.M.W.* pp. 361–362.]

i. In oedematous and atrophic beriberi, but not in cardiac forms, some alteration of the basal metabolism was observed. In experimental B. avitaminosis in healthy men there was no definite change from the normal.

ii. A spore-bearing bacillus was isolated from boiled rice which was not destroyed by the gastric juice but was by pancreatin. Cultures of this given by mouth to chickens and monkeys produced beriberi-like symptoms. The author thinks that some cases clinically diagnosed as beriberi may be caused by the toxic action of this bacillus.

iii. The author found that in advanced cases of human beriberi there was a reduction in the red cells, haemoglobin, fibrinogen and blood gas content, a reduced coagulation time and precipitation rate. In polished rice disease there was a reduction in the red cells, haemoglobin and viscosity, but the blood protein content and fibrinogen were increased by 50 per cent.; the coagulability and precipitin rate was also increased. In starvation and in artificially bled animals the red cells, haemoglobin, serum protein and viscosity were all decreased, but the fibrinogen was either unchanged or increased. The red cell precipitation rate and coagulability were increased.

iv. The author found that in beriberi and B avitaminosis there was no accumulation of CO_2 in the blood, although there might be some acidosis. The latter he considered was due to an increase of the H ion content of the blood caused by the production in excess in the tissues of organic acids and metabolic by-products which lower the blood alkalinity and finally alter the H ion concentration.

v. Experiments were carried out to determine the differential causative factors, if any, of beriberi oedema in the initial and advanced stages of the disease. The author found that oedematous beriberi might be divided into two forms, firstly, those in which the oedema had no relation to any disturbance of the kidney functions, and secondly, those cases in which the oedema was due to defective kidney excretion, as shown by the hypophosphite of soda test, the deficiency running parallel with the amount of the oedema.

P. W. B–S.

SCURVY.

PRISTON (J. L.). **The Prevention of Scurvy in the Navy. With Appendix.**—*Jl. Roy. Nav. Med. Serv.* 1926. Jan. Vol. 12. No. 1. pp. 1–20. [45 refs.]

Surgeon-Commander Priston gives a very interesting historical review of the prevention of scurvy in the Navy and points out how inefficient the modern preparations of lemon and lime juice have been. Incidentally, he states that during the war over 200 cases of ship beriberi occurred in the Navy and that by general agreement lack of fresh vegetables was a predisposing factor. The great disadvantage of modern antiscorbutics such as germinating peas, tomatoes, etc., is the bulk which would have to be stowed on a large ship to provide adequate quantities and also the difficulties of preservation owing to heat, etc. He gives a very full description of a preparation of concentrated orange juice manufactured by the Exchange Orange Products Co. of San Dimas, California, and marketed by the proprietors of Glaxo. This is now prepared upon a large scale and sold at a moderate price. The author's experiments showed that if kept in cold storage the preparation will retain its antiscorbutic powers for long periods almost unimpaired. The addition of rum reduces its keeping qualities. If kept at 19 C. its potency is reduced to one-third, but is still equivalent to that of an equal volume of fresh orange juice. Kept at 37° C. its value is rapidly lost. Finally, it is stated that if the use of lime juice were abolished and concentrated orange juice substituted a potent antiscorbutic would be issued instead of a useless beverage, and about £4,000 per annum saved. The author is to be congratulated upon a very thorough and careful investigation which should be of great value to the service afloat.

P. W. Bassett-Smith.

DUNLOP (Norman J.). **James Cook and the Australian Medical Harbingers.**—*Med. Jl. Australia.* 1925. Sept. 19. 12th Year. Vol. 2. No. 12. pp. 362–373.

In this interesting account of Captain COOK's voyages is recorded the work done to prevent scurvy breaking out and the steps taken to cure it. Attention is particularly drawn to the fact that little credit has so far been given to the medical officers, Dr. Broughton MONKHOUSE and Dr. Wm. PERRY; in fact, Dr. HAWKINS (*Australian Medical Gazette,* 1891) states that Capt. COOK carried no surgeon.

On leaving England, by order of the Admiralty, acting on the recommendation of Dr. MCBRIDE, a supply of malt was to be carried in a dry place to be made into wort, as this might be of great benefit to seamen in scorbutic and other putrid diseases; full records were to be made as to its effect. The malt was to be well ground and infused every day with boiling water for 3 or 4 hours, the wort to be then boiled and made into a panada with biscuit. The infusions was to be drunk and panada taken twice a day.

There were 9 cases of scurvy in all, with 1 death. The good health is attributed by Dr. PERRY to the use of the wort by the crew as a part of the diet at sea.

As prophylactics sauerkraut, mustard, vinegar, wheat, inspissated orange and lemon juice, portable soups, sugar and vegetables were

more or less constantly used with excellent results. Cold baths were encouraged, the quantity of salt pork and beef was cut down and the admixture of salt beef fat with flour was forbidden, raisins being used instead. The wort was first given to the men who were ill or convalescent from a "bilious disorder" in 1768. When at Rio there was no scurvy. At Tierra del Fuego wild celery was collected and used. The first scurvy cases appeared on the way to Otahiti. PERRY was one of them; they were treated with the wort and greatly benefited. PERRY says, "the wort is the best medicine I know, not excepting inspissated orange and lemon juice." The use of MCBRIDE's malt extract was therefore a great success in preventing and curing the disease. On the first voyage the death rate from scurvy was 1 per cent., but on the second voyage a larger number was attacked. An interesting letter from Dr. HULME states that by order of Dr. FOTHERGILL the following were sent to the ship: A cask of 6 gallons of lemon juice evaporated down to less than 2, a cask of 7 gallons of orange juice and 1 gallon of brandy, a small cask with 5 quarts of lemon juice and 1 of brandy. A recommendation was also given to take in fresh orange and lemon juice when possible and to brew beer to be used if the water was bad.

P. W. B–S.

WILLIAMSON (R. T.). **Sir Richard Hawkins and the Treatment of Scurvy in the Reign of Queen Elizabeth.**—*Jl. Roy. Nav. Med. Serv.* 1925. Oct. Vol. 11. No. 4. pp. 269–271. [1 ref.]

In "The Observations of Sir R. Hawkins in his Voyages into the South Seas, A.D. 1593" will be found some of the first references to the value of oranges and lemons in the treatment of ship scurvy, "the plague of the seas and spoyle of marines." He remarks on the very high incidence of the disease in ships, and the great joy with which fresh lemons and oranges were received by all, for their antiscorbutic value was fully appreciated. John WOODALL, who wrote the "Surgeon's Mate," published in 1617, had preached the same doctrine.

The work of David MCBRIDE, another Naval surgeon, "On the Scurvy with a proposal for trying New Method to prevent or cure the same at sea," was published in 1764. He recommended fermented malt as an easy way of providing in ships a growing vegetable substance which might act as a green vegetable and consequently cure scurvy—a piece of deductive reasoning of great acumen and wisdom. We have seen (above) how it was provided for Captain COOK and what PERRY thought of it, but it is rather sad to read that after having received news that their Lordships had given orders for his method to be tried at Portsmouth and Plymouth hospitals in 1762, he wrote in 1766, "I take it for granted that nothing has been done in consequence of that order, nor any report made." He was unduly pessimistic, as we have noted, though there is little record of his method having been employed except on Captain COOK's voyages.

P. W. B–S.

SCHMITT (Karl). Skorbutversuche am Meerschweinchen. [**Scurvy Experiments on Guineapigs.**]—*Klin. Woch.* 1925. Oct. 29. Vol. 4. No. 44. pp. 2104–2105.

The author quotes the opinion of MYER & NASSAU that the guineapig test is essential for efficient milk examination; this was founded on

their experience at the children's clinic in Berlin where fresh goat's milk was used. The so-called goat's milk anaemia is believed by STOELZNER to be of toxic origin, and due to the reabsorption of a fatty acid with haemolytic action, rather than due to avitaminosis. The author supports FRANKS' view that guineapigs are *not* generally suited for testing infant milk; the animal is so sensitive that the results cannot give a reliable indication of the action on the human organism. Much original work has been carried out by the author, who found that 50–60 grams of goat's milk appeared to protect guineapigs for at least three months. Experiments with butter milk, largely used in children's clinics with success, were also made. Two preparations were used: "Töpfers and Buro" 50 grm. per diem. The animals developed scurvy, but lived twice as long as the controls, and twice as long as those of MYER & NASSAU; from this the author concludes that butter milk protects children against scurvy.

These results cannot be considered conclusive, and the author himself states that further work is desirable.

P. W. B–S.

MOURIQUAND (G.) & BERNHEIN (M.). Nouvelles recherches sur les relations entre l'âge et l'apparition des troubles d'avitaminose C. [**New Researches on the Relation between Age and the Appearance of Scorbutic Symptoms.**]—*C. R. Acad. Sci.* 1925. Dec. 21. Vol. 181. No. 25. pp. 1103–1104. [1 ref.]

It has already been shown that age of the animals under experiment influences the course of the symptoms and death rate. In guineapigs of 200 to 1,300 grams the course varies from 1 to 18 months. 30 animals were taken, from 70 to 800 grams, the youngest 15 days to 3 weeks old:—

Weight.	Appearance of Pain.	Appearance of Crepitations.
70–200 (10)	13 days	19 days
200–400 (10)	7·5	14·8
600–800 (10)	16·3	25·7

The very young appeared to be more resistant than the older animals, which suggests that the young animals preserve a certain amount of the protective substance derived from the mother. This is similar to what is found in children, for the first symptoms of scurvy only appear after the age of six months.

P. W. B–S.

RANDOIN (L.) & MICHAUX (A.). Réserves glycogéniques et glycémie artérielle (effective et protéidique) au cours du scorbut expérimental. [**Reserves of Glycogen and Arterial Glycaemia in Experimental Scurvy.**] *C. R. Acad. Sci.* 1925. Dec. 28. Vol. 181. No. 26. pp. 1179–1181. [3 refs.]

The experiments were carried out to show whether in scurvy the glycogen stored in the liver and muscles was reduced or not. The tables show that in the course of the disease the glycogen reserves are less than in normal animals, but there remains even at the time of death a moderate amount. The changes in scurvy are considered to

be specific, and should not be confounded with those of starvation. The disturbed alimentary equilibrium resulting from a total absence of vitamin C does not appear to reduce the reserve of glycogen, and it certainly does not alter the free sugar in the blood.

P. W. B–S.

MOURIQUAND (G.) & LEULIER. Avitaminose C (avec ou sans tuberculose) et cholestérine du sang et surrénales. [**Avitaminosis C (with or without Tuberculosis), the Blood Cholesterin, and the Suprarenals.**]—*C. R. Acad. Sci.* 1925. Oct. 5. Vol. 181. No. 14. pp. 434–435. [3 refs.]

The authors have already shown that the cholesterin in the blood of normal and scurvy guineapigs does not sensibly vary; in the present series of experiments they demonstrate that in acute as well as chronic C. avitaminosis there are marked disturbances of metabolism of cholesterin in the adrenals without any definite effect on the cholesteraemia. This disturbance is aggravated by association of tuberculosis with the avitaminosis.

P. W. B–S.

LINDSAY (Blanche) & MEDES (Grace). **Histological Changes in the Testis of the Guinea-Pig during Scurvy and Inanition.**—*Proc. Soc. Experim. Biol. & Med.* 1924. Dec. Vol. 22. p. 177.

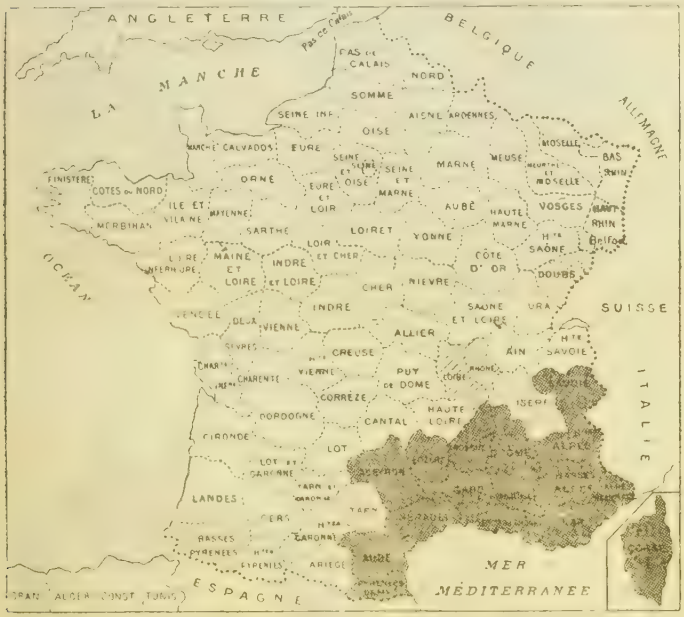
In the histological examination of the testes of guineapigs fed upon a diet deficient in vitamin C, as compared with normal animals, there was found retardation of development in young animals and degeneration of the sperm cells in older ones. Variation in the amount of change in the testis appeared to be parallel to that in the adrenals.

P. W. B–S.

UNDULANT AND ABORTUS FEVERS.

AUBLANT, DUBOIS, LAFENÊTRE & LISBONNE. La fièvre ondulante en France. Distribution géographique. Epidémiologie. Prophylaxie. [**Undulant Fever in France; Distribution, Epidemiology, Prophylaxis.**]—*Rev. d'Hygiène.* 1925. Dec. Vol. 47. No. 12. pp. 1090–1111. With 3 maps in text. [7 refs.]

The menace to France of undulant fever was recognized to be so great that in 1923 a full enquiry was determined upon by the Société de Médecine Publique, and the above-mentioned distinguished men, two of whom are veterinarians, were directed to carry it out. It was estimated that 3,000–4,000 people in France had suffered from



Map 1. Distribution of Undulant Fever in France and Corsica.
Dark shading.—Undulant fever endemic.
Light stippled shading.—Autochthonous cases occasionally occur.
Light diagonal shading.—Some introduced cases reported.

the disease since 1920, and that it was still increasing. A questionnaire was sent to the clinicians and laboratories of all the 90 Departments, and replies were received from 84. The first point was to find out the number of Departments infected. These were found to be 14, besides Corsica; or one-fifth of the area of France was infected in the region of Languedoc and Provence, namely, the south-east and Mediterranean area. The intensity of the infection was more difficult to estimate owing to insufficient laboratory examination, but Drs. RANGUE and SENEZ in 1923–4 found 681 cases, proved by serum

agglutination and blood cultures, in Bouches de Rhône, Vaucluse, Var and Basses-Alpes. In 5 laboratories 1,181 cases have been proved in the Midi. These figures show the great gravity of the situation. The infected area is divided into: (*a*) 15 Departments heavily infected; (*b*) 6 infected, but cases rare; (*c*) 3 areas not infected, but showing cases introduced from without. From the sea the disease had spread to the Alps and Cevennes.

Its extension, formerly attributed to the herds of infected goats, is now known to be due also to ewes, which play a rôle as important, if not more so, in the Mediterranean region. The charts showing the endemic areas of undulant fever and epidemic abortion of sheep are almost identical; but the returns of bovine epidemic abortion cover practically the whole of France except the area occupied by the first two, to which they are complementary. It is impossible to

Map 2. Distribution of Epizootic Abortion (goats and sheep) in France and Corsica.

Dark shading.—Epizootic abortion endemic in goats and sheep.

say that this will always remain so, and the authors express their belief that the virulence of the two organisms is likely to alter and the pathogenicity to man to vary.

The method of infection is next investigated, and it is made very clear that direct infection, particularly in country districts, probably by means of infected urine, plays as important a part as ingestion of milk and its products. It is interesting to note that the incidence of the disease varies much from year to year; during the great war it was much reduced again to rise in 1920 owing to increased trade and

intercommunication. In 1900–1 two or three Departments only were infected, *to-day there are fifteen*, and the steady spread of the disease northwards is very serious. Much is written about prophylaxis and the necessity of strict measures to prevent the use of infected material and about the isolation of infected animals, which must be enforced by law. If the disease is to be overcome it must be recognized that sheep as well as goats are " carriers " and that infection is caused by other means than food. The veterinary officer must work with the hygiene department.

Map 3. Distribution of Bovine Epizootic Abortion in France and Corsica.
Dark shading.—Epizootic abortion endemic in cows and mares.
Light stippled shading.—Departments from which information is not available.
[Maps 1 to 3 are reproduced from the *Revue d' Hygiène.*]

The enquiry forms sent out are reproduced, and suggestions are made for further investigations. The paper is most valuable and tends to dissociate the abortion of cattle from undulant fever which is closely correlated with the epidemic abortion of ewes and goats.

P. W. Bassett-Smith.

BARBARY (Fernand). Prophylaxie de la fièvre ondulante dans les Alpes-Maritimes. [**Prophylaxis of Undulant Fever in the Alpes-Maritimes.**]—*Rev. d' Hygiène.* 1925. Dec. Vol. 47. No. 12. pp. 1134–1139.

Undulant fever was first noted in this area in 1910, but has become much more prevalent in the last few years. Cases are probably missed

because knowledge of its clinical characters and diagnosis is not general. The author emphasizes the point that besides measures against the use of infected milk and cheese, the indirect factors must be combated. These are sale and transport of sick animals, manure infected by sick goats, etc., which is inoculated through the skin, and possibly mosquitoes. For prophylaxis one must insist upon the boiling of all milk, proper sanitary measures for stables and manure, isolation of all infected animals and penalties for the sale of milk from these.

P. W. B–S.

DARGEIN & BELLIEF. Considérations sur l'étiologie et la prophylaxie de la fièvre de Malte dans la région toulonnaise. [**The Etiology and Prophylaxis of Undulant Fever in the Toulon Region.**]—*Rev. d' Hygiène.* 1925. Dec. Vol. 47. No. 12. pp. 1140–1144.

In the region of Toulon undulant fever is relatively common but sporadic in character. Infection is traced to the use of the milk or cheese of goats and ewes. An instance is given where 7 sub-officers were infected by a puppy which lived and ate with them. Laboratory infection and the contamination of utensils by urine are well known, but inter-human or hospital infection is very rare. All prophylactic measures must be based upon the above facts.

P. W. B–S.

CASSAN (A.). La fièvre méditerranéenne dans l'Aude. [**Undulant Fever in the Aude Department.**]—*Rev. d' Hygiène.* 1925. Dec. Vol. 47. No. 12. pp. 1144–1147.

The department of Aude near the Pyrenees is partly mountainous and little populated, partly flat and well cultivated. In the former the number of goats and sheep is large, and they are widely scattered, travelling much. It is believed that the disease was introduced from the south. At least 150 cases have been reported, one-tenth of which were in children, the greater number, however, being men employed on the land. The cause did not appear to be the consumption of milk and cheese, but rather cutaneous infection from manure, etc. The history of 31 cases demonstrates this. Infection of food by contaminated hands is also very probable and infection of water is said to be an occasional cause.

P. W. B–S.

RANQUE & SENEZ. La mélitococcie en Provence au cours de ces dernières années. **Undulant Fever in Provence in Recent Years.** —*Marseille-Médical* (*Bull. mensuel Soc. Méd. et d' Hyg. coloniales de Marseille*). 1925. Oct. 25. pp. 1684–1691. [Summarized in *Bull. Inst. Pasteur.* 1925. Dec. 31. Vol. 23. No. 24. p. 1071.]

From January 1920 to October 1925 the authors have identified in their laboratory 904 cases of undulant fever. They recognize that the disease is common in Provence and that it is advancing northwards, the cases being most frequent in the spring. The movement of herds in changing pasture is the most dangerous means of propagation. For positive determination they consider that sedimentation with a complete clearing of the suspension after 18 hours at 37° with a minimum dilution of 1 in 200 is reliable.

P. W. B–S.

BURNET (Et.). La fièvre méditerranéenne, spécialement au point de vue exotique. [**Undulant Fever, chiefly from the Exotic Aspect.**] —*Rev. d'Hygiène.* 1925. Dec. Vol. 47. No. 12. pp. 1112–1129.

It is well known now that centres of undulant fever are widely distributed all over the world, but chiefly in sub-tropical and temperate zones, and that the disease tends to spread in the latter. The principal source of infection is the udder of the goat, and it is still doubtful whether the udder of the cow infected with *B. abortus* is another source; if so, eradication would be much more difficult. The points for and against the unity of the two organisms are clearly put forward. Though the intradermal method, according to the author, is the best for diagnosis in the human disease, it cannot be applied in the caprine. Again, man can be vaccinated against undulant fever, but this is much more difficult in the goat; vaccination should be employed in very young kids.

Immunity and the protection of infants through the mother are discussed, but nothing new is brought forward.

P. W. B–S.

TANON (L.). Le mélitococcie peut être considérée comme une fièvre intermittente. **Undulant Fever an Intermittent Fever.**]—*Bull. Méd.* 1925. Nov. 7. 39th year. No. 45. pp. 1197–1198.

The irregularity of the fever and uncertainty of laboratory procedures in undulant fever are pointed out, but its septicaemic character is accepted by the author. He thinks that the disease would be better described as an intermittent septicaemia, the organism being present in the blood during the attack, the antibodies at the decline, and it is at these particular periods that blood culture, serum tests and treatment should be of most use. He lays much emphasis upon the intermittent appearance of agglutinins in the blood as proof and quotes a case with following notes :—

Agglutination.	1–10	1–30	1–50
Onset of attack	—	—	—
Rise of temperature ...	—	—	
Acme	—	—	
Commencement of fall ...	+	+	+
During fall	—	—	-
Apyrexial period	—	-	- -

[This most certainly is not a common finding; *vide* abundant work done at Malta and in England, though absence of agglutination response has frequently been noticed, particularly in chronic cases. Short negative phases have been demonstrated also. It must not be forgotten that "Melitococcie" is protean in its clinical and serological characters, and that deductions from a few cases are often erroneous.]

P. W. B–S.

DOMINGO (Pedro). El tratamiento especifico de la fiebre de Malta. [**Specific Treatment of Undulant Fever.**] —*Rev. Méd. de Barcelona.* 1925. Sept. Year 2. Vol. 4. No. 21. pp. 240–248. With 6 charts.

By cultivating *M. melitensis* in an acid medium emulsions were obtained which were more readily agglutinated than ordinary agar cultures, while those treated with ox-bile were still more agglutinable.

63 cases of undulant fever were given vaccines by mouth and 41 of them (65 per cent.) were cured in less than 15 days, 11 more within 30 days, while only 7 relapsed. The method of preparation of the vaccine was as follows :—

Freshly isolated organisms were cultivated on agar and emulsified in sterile water. On addition of a mixture of alcohol and ether in equal parts the bacilli were precipitated. The fluid, after contact for 12 hours, was decanted and the sediment subjected to the action of sterile filtered ox-bile, the whole being well shaken to obtain a uniform emulsion. The bile was then removed by repeated washing in sterile saline and centrifuging. The residue was weighed and diluted in the proportion of 100 cc. of a mixture in equal parts of water, neutral glycerine and alcohol (90 per cent.) to each gramme.

1 cgm. of the bacterial emulsion, *i.e.*, 1 cc. of the final product, was given daily till 6 days after the fever had subsided, the dose being taken fasting by mouth and no food allowed till two hours later.

H. Harold Scott.

HAUDUROY (Paul) & PACAULT. Un cas de fièvre de Malte à Paris. Traitement par la vaccinothérapie. [**A Case of Undulant Fever at Paris treated by Vaccines.**] —*Rev. d'Hygiène.* 1925. Dec. Vol. 47. No. 12. pp. 1129–1134. [6 refs.]

A girl aged 14 whose symptoms commenced in January 1925, about ten days after eating fresh goat cheese in Rheims, was at first treated for enteritis without fever. In April there was high fever with sweats and some arthritic pains. The fever became more septicaemic in type, and a blood culture gave a pure growth of *M. melitensis*, from which a vaccine was made. The intradermic reaction was positive. The first vaccine given consisted of 50,000,000 organisms, the second 100,000,000, and after that 200,000,000, repeated every second day, eight doses in all. Improvement was rapid and sustained. The author states that this case controverts the statement of COURY and others that the administration of vaccines is dangerous in this disease, and he points out that the good result was entirely due to laboratory help in diagnosis and treatment.

P. W. B–S.

ODDO (C.). [Note sur le traitement de la fièvre de Malte par l'autohémothérapie.] **Treatment of Undulant Fever by Autohaemotherapy.** —*Marseille-Médical* (*Bull. mensuel Soc. Méd. et d'Hyg. coloniales de Marseille*). 1925. Oct. 25. Year 62. pp. 1700–1702. [Summarized in *Bull. Inst. Pasteur.* 1925. Dec. 31. Vol. 23. No. 24. p. 1091.]

In three cases of auto-haemic inoculation in undulant fever the author obtained good results. He takes 5 cc. of blood from the arm, and 2 cc. of the citrated serum is injected subcutaneously, and repeated every third day until the fever ceases.

OLMER reports less constant good results.

P. W. B–S.

BOX (C. R.) & BAMFORTH (J.). **A Case of Undulant Fever contracted in England, and complicated by Haemorrhagic Effusion into the Peritoneal Cavity.**—*Lancet.* 1925. Nov. 28. pp. 1115–1116. [1 ref.]

A case of prolonged fever is described in which there was a very definite serum agglutination to a high titre both with the *M. melitensis*

and *B. abortus*, but the infecting organism was not isolated from the blood or urine. The case is of special interest for its contraction in England apparently through the use of raw goat's milk (which was afterwards proved to be infected by one of the group), the irregular character of the fever and the occurrence of an haemorrhagic non-infective ascites.

The incubation period is put down as 10 days and the duration of the disease as 5 months. Though the man had served in France during 1917 there was no history of illness beyond influenza and trench fever.

[The infection of the goat does not appear to have been followed up. This is an important point, for no case of Melitensis infection of goats in England has been previously described, and if the animal was infected with *B. abortus* it should have been notified. The cause of the fever is so far not definitely proved.]

P. W. B–S.

MacKeown (R. J.). **Malta Fever.**—*Jl. Roy. Nav. Med. Serv.* 1925. Oct. Vol. 11. No. 4. pp. 295–298.

The case of an officer suffering from undulant fever which practically incapacitated him for twelve months. The disease was contracted on the Mediterranean station (place not mentioned) and treated at the Naval hospitals of Malta and Chatham. Though there was no doubt as to the diagnosis, the serum reactions with *M. melitensis* were very slight or negative, and no paramelitensis or melitine tests are recorded. At Malta three intravenous injections of N.A.B. were given, but without beneficial effect, and specific vaccines were not tried.

P. W. B–S.

Micheli (F.). Forma pseudo-tubercolare di febbre maltese. [**Pseudo-tuberculous Form of Undulant Fever.**] *Riforma Med.* 1926. Feb. 1. Vol. 42. No. 5. pp. 110–111.

This is a record of another case of undulant fever showing signs suggestive of tuberculous infection, namely, fever, sweating, some degree of wasting and anaemia, localized râles, a troublesome dry cough, and a positive reaction to tuberculin, but no acid-fast bacilli were found. The patient's serum in a dilution of 1 : 800 agglutinated *M. melitensis*, and the organism itself was obtained by haemoculture during the second febrile period. As the general symptoms yielded to treatment so did the local pulmonary signs disappear.*

H. Harold Scott.

Kirschner (L.) & Kunst (C.). **Infectious Abortion in Cows in the Netherlands East Indies and its Significance for the Human Pathology.**—*Meded. Dienst. d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 3. pp. 270–291. [23 refs.]

A very full account is given of the prevalence, epidemiology and etiology of infectious abortion of cattle in the Dutch East Indies, and

* [In the early years of 1900–1907 cases diagnosed as Mediterranean phthisis were fairly frequent in the Navy in that area, which entirely cleared up after the fever was cured—and in which no T.B. were found—but tuberculin tests were not made.]

P. W. B–S.

it is again stated that the bacillus of Bang and the micrococcus of undulant fever cannot be distinguished *in vitro* or by animal experiments, though no fresh proof is brought forward. If the organisms are identical the disease should be common among the staff of the infected farms; this has not been reported, though stable attendants tested had a high agglutination titre. Rules for prophylactic vaccination of animals are given; the authors do not favour the use of living vaccines, as they are dangerous, except in seriously infected herds where rigorous isolation can be carried out.

P. W. B–S.

TINTI (Mario). Sulla questione della setticemia umana da bacillo di Bang. [**Septicaemia in Man due to Bang's Bacillus.**]—*Riv. di Clin. Med.* 1925. Sept. 30. Vol. 26. No. 18. pp. 649–666. With 8 text figs. [10 refs.]

This paper constitutes an interesting record of observations to test the validity of the method of FICAI and ALESSANDRINI for differentiating *M. melitensis* from *B. abortus* (see this *Bulletin*, Vol. 22, p. 511). Details of three patients are given, all confirming the same points. One example may be presented here. A man, 29 years of age, had not drunk goats' milk nor partaken of any of its products; he always took fresh cows' milk. A fortnight after attending an aborting cow he developed a febrile condition in all points resembling undulant fever. His serum reactions were as follows: positive agglutination up to 1 : 1,000 with three strains of each organism. After heating to 65° C. for 30 minutes, diluting first with distilled water and later with saline, according to FICAI and ALESSANDRINI's method, the results were negative with both at first, but after standing at room temperature for 24 hours the agglutinative powers returned in part, but equally for each organism. Serum from the aborted cow agglutinated two strains of *B. abortus* in a dilution of 1 : 1,200 and a third at 1 : 1,000, and two strains of *M. melitensis* at 1 : 1,200, but with a third was negative. The same serum after heating was negative to both. By puncturing the patient's spleen an organism was grown which, morphologically and biologically, was identical with *M. melitensis* (or *B. abortus*) and was agglutinated by immune sera against either at a titre of 1 : 5,000, and by the patient's serum at 1 : 1,200.

In the latter part of the paper is an account of experimental work carried out with the two organisms and various antisera, some made by the author, and others obtained commercially, and it was found that the agglutinating power was removed by heating to 65° C. in all the samples. The question is posed: "May not the organism of contagious abortion be the cause of undulant fever?" in other words, may not the two organisms be identical, since, neither culturally, morphologically, nor serologically, are there any really valid distinctions?

H. Harold Scott.

FAVILLI (Giovanni). Ricerche comparative sulla morfologia del *b. melitensis* e del *b. abortus* (Bang). [**Comparative Work on the Morphology of** *B. melitensis* **and** *B. abortus.*]—*Sperimentale.* 1925. Vol. 79. No. 6. pp. 1041–1048. With 1 plate. [26 refs.]

A study of the structure of *M. melitensis* and of *B. abortus* by means of vital staining and dark-ground illumination shows that there is

no true motility of either in a broth culture of the organisms; that each contains the refractile intracellular granules; that some members show a comparatively thick prolongation at one end analogous to a terminal cilium; and that these are, therefore, not differentiating criteria.

H. Harold Scott.

VERCELLANA (Giuseppe). Differenziazione microscopica del micrococco melitense dal bacillo di Bang col metodo di Bezssonof. [**Differentiation of** *M. melitensis* **and** *B. abortus* **by Bezssonof's Method.**]—*Pathologica.* 1925. Oct. 15. Vol. 17. No. 406. pp. 553–554.

BEZSSONOF in 1919 proposed three staining methods for the differentiation of *B. coli* from *B. paratyphosus B.* The author carried out the same procedures with *M. melitensis* and *B. abortus*, and finds that the staining reactions by methods (2) and (3) give identical results, but that by BEZSSONOF's first method *M. melitensis* is stained red, *B. abortus* blue. The details of this method are :—

The preparation (apparently a smear on a slide) preferably of a young culture is submitted for 20 hours at 37° C. to the action of a mordant composed of bichromate of potassium (gr. 1), tartar emetic (gr. 0·40), in water (100 cc.). The slide is then washed, first in tap-water and afterwards in repeated changes of distilled. It is next placed in 0·17 per cent. solution of Wasserblau for 2 hours at 100° C. and again washed in tap and distilled water successively. This is followed by immersion in 0·07 per cent. chrysoidin in distilled water for 1½ hours at 100° C. and three washings in distilled and three in tap-water. Finally, it is treated with Bengal-red (0·32 per cent. in distilled water) for ¼ hour at 65° C. and 14 hours at 37° C. After being washed in distilled water it is dried and examined.

H. Harold Scott.

EVANS (Alice C.). **Geographical Distribution of the Serological Groups of** *Brucella melitensis.*—*Amer. Jl. Trop. Med.* 1925. Nov. Vol. 5. No. 6. pp. 419–423. [1 ref.]

After discussing the wide geographical distribution of undulant fever and its occurrence in goats, sheep, dogs and cattle the author points out that in 2 out of the 6 cases in America due to the abortus variety of the organism infection was caused by handling hog carcasses in slaughter houses. Though abortus infection is very common, human cases are very rare compared with those that occur in the Mediterranean countries due to goats. From serological data, arrived at chiefly by absorption methods, a table is drawn up showing that the infection of *Brucella melitensis* var. *abortus* is not limited to any particular species of animals. Of the 8 serological groups, 4 of the abortus section are confined to the United States and the countries of northern and central Europe, whereas 4 groups, namely para-abortus, melitensis A and B, and para-melitensis are confined to the Mediterranean countries. An exception is the variety melitensis A, which exists along the Mexican border and sporadically in other parts of America. The abortus variety is characteristically a bovine affection, but also affects hogs and man. Finally, as both types of organism cause clinically typical "Malta" fever in man, and a similar kind of disease in animals, the two should be considered to belong to a single species.

P. W. B–S.

CANALE (Piero). Sulle intradermoreazioni a scopo diagnostico nelle febbri infettive (tifo e melitense). [**Diagnostic Intradermal Reactions in Typhoid and Undulant Fever.**]—*Riv. di Clin. Med.* 1925. July 30. Vol. 26. No. 14. pp. 527–536. [10 refs.]

Previous attempts to establish cuti-reactions for the diagnosis of fevers of the melitensis-typhosus group having yielded uncertain results, the author, thinking that the broth-proteins might be responsible for the local reactions, prepared his "antigens" by emulsifying agar cultures of the various bacilli in distilled water, killing them by heating to 60° C. for an hour, centrifuging to throw down the organisms, and drying the precipitate at 37° C. For the test 1 cc. of distilled water and 1 drop of 5 per cent. carbolic acid were added for each mgm. of the dried residue. The local condition was noted at intervals of 2–48 hours after the intradermal inoculation of 0·1 cc., and the maximum reaction was found to be reached in 12–14 hours, after which time it gradually faded. The results are interesting. A melitensis antigen gave a strong positive in 18 cases of undulant fever, a weak positive in 4 cases of typhosus and 2 of *B. paratyphosus B* infection. *B. typhosus* antigen proved negative with melitensis infection, markedly positive (+++) with typhoid cases, less marked (++) with paratyphoid; corresponding results were obtained with *B. paratyphosus B* antigen. All three antigens gave a weak or doubtful positive (±) in tuberculous subjects. In 60 control patients the result was entirely negative. The test is most specific, therefore, for undulant fever, less so in the typhoid-paratyphoid group.

H. Harold Scott.

CANALE (Piero). L'inattivazione dei sieri nella melitense. [**Inactivation of the Serum in Undulant Fever.**]—*Riv. di Clin. Med.* 1925. Sept. 15. Vol. 26. No. 17. pp. 631–636. [15 refs.]

In view of the uncertainty of results of the agglutination test for undulant fever, in other words the non-specificity of the test which some writers have recorded, and the suggestion which has been made that heating the serum to 56° C. for half an hour did away with this by getting rid of co-agglutinins, the author tested 600 sera during the course of two years. He concludes: (1) That inactivation, that is, heating as above, is not only useless, since irregular positives are still obtained in low dilutions, but that it is harmful in that some sera which agglutinated at 1 : 600 lost the power completely and did not regain it, or only partially, on standing at room temperature; (2) that reactions at lower titres than 1 : 200 should be disregarded, since sera of patients with pulmonary abscess, or influenzal bronchopneumonia, for example, may agglutinate to that degree; (3) that the character of the flocculation is important. This, with a patient's serum in a positive case, is bulky, definite and clean cut (frastagliati), whereas in doubtful or non-specific cases it is fine, powdery and indefinite. This flocculation is not so marked with animal immune sera. The result of heating a patient's serum to 56° C. for half an hour in some instances transformed the definite bulky flocculation into the indefinite turbidity of non-specific agglutination.

H. Harold Scott.

i. DE GASPERI (F.). [Sintomi e lesioni nella infezione nella camera anteriore dell' occhio del coniglio da micrococcus melitensis.] **Symptoms and Lesions in Melitensis and Abortus Infections of the Anterior Chamber of the Rabbit's Eye.**]—*Soc. Toscana di Sc. Naturali Memorie.* Pisa. 1925. Vol. 36.

ii. ——. [Infezione della cavia e del coniglio da bacillo di Bang inoculato nella camera anteriore dell' occhio (Reperti anatomo-istologici e sierologici).]—*Ibid.* Vol. 37. [Both summarized in *Bull. Inst. Pasteur.* 1925. Dec. 31. Vol. 23. No. 24. p. 1074.]

i. When strains of *M. melitensis* were inoculated into the anterior chamber of the eyes of rabbits the results were irregular. After the early signs in some the lesion quickly cleared up, but in others it went on to plastic iritis.

ii. After inoculation of *B. abortus* in both guineapigs and rabbits there might be early congestion, oedema of the iris with lymph, vascularity of the cornea and diffused keratitis. Since *M. melitensis* produced the same results this method is of no use for differential diagnosis.

P. W. B–S.

DENGUE.

SILER (J. F.), HALL (M. W.) & HITCHENS (A. P.). **Transmission of Dengue Fever by Mosquitoes.**—*Proc. Soc. Experim. Biol. & Med.* 1925. Dec. Vol. 23. No. 3. pp. 197–201.

This is a summary of the results of experiments relating to the transmission of dengue by mosquitoes carried out by the American Medical Research Board at Sternberg General Hospital, Manila. The only forms likely to be concerned in the transmission of dengue were *Aëdes egypti* and *Culex quinquefasciatus* (*C. fatigans*). All the mosquitoes used were bred from the egg and carefully fed. At first normal horse serum with formalin was used; later banana was found to be the best diet. Freshly bred *Aëdes* would not bite on the day of their emergence, but after having taken food and been fertilized they took blood freely.

Sixty-four military volunteers, non-immunes and free from the disease, were used. Dengue was produced experimentally in 52 instances, or 81 per cent. In 111 biting experiments with *Aëdes egypti* there were 47 positives; of 7 with the culex, all were negative.

The previous experiments showing that *Aëdes* transmits the disease were fully confirmed. The mosquitoes were not infective until the 11th day. The patient was only infective to the *Aëdes* during the first three days, and not in the period before the onset. The experiments showed that once infected *Aëdes* is able to transmit throughout its life but not to the next generation. The incubation period of the disease in the 47 experimental cases varied between 4 and 10 days. In 41 of the 47 cases the virus was from the same strain and was passed from man to mosquito and back to man through 6 generations. It was not attenuated, nor was the virulence increased. 50 per cent. of the positive cases were bitten by from 2 to 10 potentially infected mosquitoes.

P. W. Bassett–Smith.

CHANDLER (Asa G.). **The Transmission and Etiology of Dengue: a Critical Review.**—*Indian Med. Gaz.* 1925. Oct. Vol. 60. No. 10. pp. 460–462. [14 refs.]

This paper hardly fulfils its claim to be a critical review. Some recent papers are discussed on the etiology of dengue, particularly those of MEGAW, and SILER, HALL & HITCHENS [this *Bulletin*, Vol. 22, p. 943]. The conclusions of the latter are generally accepted by the author with the reservation of that which states that the dengue virus requires 11 days or more for development in the mosquito before transmission can occur, which was based on three cases only. Chandler and RICE succeeded in transmitting the disease in 4 out of 6 cases with mosquitoes which had been infected 24, 48, 72 and 96 hours; this agrees better with epidemiological observations than the finding of the authors quoted. Chandler states that the specificity of disease organisms to particular species of insect transmitters is as a rule not absolute, as in malaria; yellow fever on the other hand has a highly specific insect vector. The fact that yellow fever and dengue are transmitted by the same mosquito does not necessarily indicate that the infecting organisms are related.

P. W. B–S.

MORISHITA (K.). **Changes and Progress in the Scientific View of the Relations between Mosquitoes and Dengue Fever.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1925. Oct. No. 247. English summary p. 7. [In Japanese.]

The author reviews the literature on the subject from GRAHAM's work in 1902 to that of SILER, HALL & HITCHENS in the Philippines (1925). He concludes that *Ædes egypti* (*S. fasciata*) is the chief agent in the dissemination of dengue, but that especially in Formosa *Ædes albopicta* (*S. scutellaris*) must be held responsible.

P. W. B–S.

HALL (Milton W.). **The Occurrence of Spirochete-like Filaments in the Blood of Dengue Patients and in Normal Individuals.** *Amer. Jl. Trop. Med.* 1925. July. Vol. 5. No. 4. pp. 307–315. With 8 text figs. [10 refs.]

The author calls attention to the filaments which appear in blood and which may be confused with spirochaetes. It is suggested that the spirochaetes described by COUVY and VERWOORT from dengue and allied fevers may be of this type as well as those described by BLANCHARD and LEFROU. Filaments of this kind have been noted by many observers (see this *Bulletin*, Vol. 21, p. 281).

C. M. Wenyon.

ROCKY MOUNTAIN FEVER.

SPENCER (R. R.) & PARKER (R. R.). **Rocky Mountain Spotted Fever: Vaccination of Monkeys and Man.** *Public Health Rep.* 1925. Oct. 9. Vol. 40. No. 41. pp. 2159–2167. With 3 figs. on 2 plates & 2 charts in text. [3 refs.]

The authors report that they have prepared a protective vaccine for Rocky Mountain fever from infected adult ticks, but up to the present the potency, keeping qualities and duration of the immunity given have not been fully worked out. The vaccine will protect guineapigs, rabbits and monkeys (*M. rhesus* and capuchins). In 34 vaccinated persons the reactions were generally mild. Intradermal reactions would be useful for hypersensitiveness. The virus-neutralizing substances can be demonstrated. The outcome of a case of Rocky Mountain fever developing 8 days after the first dose of the vaccine suggests that the infection was modified. It is thought that the vaccine might be used each spring in those persons who are constantly exposed to the infection.

P. W. Bassett–Smith.

WATANABE (Yoshimasa). **Experimental Studies on Rocky Mountain Spotted Fever.**—*Saikingaku Zasshi.* (*Jl. of Bact.*). 1924. Oct. No. 344. [Summarized in *Japan Med. World.* 1925. May 15. Vol. 5. No. 5. p. 132.]

The author observed that the virus infected guineapigs, but not rats. In the former the symptoms developed after an incubative period of 2 to 10 days, and the virus was found abundantly in the blood. It was non-filterable and was weakly resistant to carbolic acid, but much more so to alcohol; the pure virus could be obtained by adding 5 per cent. of alcohol. It was found only in the plasma layer when the infected blood was centrifuged.

P. W. B–S.

La Bier (C. R.). [**Rocky Mountain Spotted Fever in Indiana; Report of Case.**]—*Indiana State Med. Assoc. Jl.* Ft. Wayne. 1925. Nov. 15. Vol. 18. p. 418. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Jan. 9. Vol. 86. No. 2. pp. 149–150.]

The case was that of a girl of Terre Haute, who had not left the city. She was bitten behind the ear by "a brown and black bug." There followed lymphangitis, then headache, fever, a skin rash and pronounced drowsiness, the latter symptom being very marked during the first three weeks of the sickness.

P. W. B–S.

JAPANESE RIVER FEVER.

Ishiwara (K.) & Ogata (N.). Studie ueber den Erreger der Tsutsugamushi-Krankheit (Ueberschwemmungsfieber). [**The Agent of Tsutsugamushi Disease.**]—*Scientific Reports from Govt. Inst. for Infectious Diseases.* Tokyo. 1924. Vol. 3. pp. 41–42. [1 ref.]

It is stated that two years ago two monkeys were successfully infected with the disease from man and the virus was passed to other monkeys. Histologically the small rickettsia-like bodies were found in the tissues and cultures from the blood were with difficulty obtained similar to those obtained from man. The organism is very pleomorphic. In monkeys the inoculations caused a lymphangitis and orchitis.

P. W. B–S.

Nagayo (M.), Tamiya (T.), Imamura (A.), Sato (K.), Miyagawa (Y.) & Mitamura (T.). **Demonstration of the Virus of Tsutsugamushi Disease.**—*Scientific Reports from Govt. Inst. for Infectious Diseases.* Tokyo. 1924. Vol. 3. pp. 37–40. With 1 plate.

The work of the authors confirms much that has been previously described and places the infecting organism of tsutsugamushi fever among the non-filterable, doubtfully cultured viruses of the Rickettsia type. They found that the intradermal was more satisfactory than the subcutaneous method of inoculation, producing typical ulcers like those seen after natural infection by the mite. The skin and lymphoid tissues of man and monkeys were used for examination and Azur 2 was found to be the best stain, showing the minute coccoid bodies in the endothelial cells. These are well demonstrated in the coloured plate.

P. W. B–S.

Hayashi (N.). Vorläufige Mitteilung ueber die Wirkung des Chemotherapeutikums "Bayer 205" bei der endemischen japanischen Tsutsugamushikrankheit. [**The Action of "Bayer 205" in Japanese River Fever.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Feb. Vol. 29. No. 2. pp. 65–67.

Three cases were treated; two recovered and one died. The first case was given 0·5 gm. Bayer 205 intramuscularly, which caused some

albuminuria; the second had 0·5, and on the following day 1 gm. The third 3 injections of 0·5 gm. ; on the sixth day profuse diarrhoea set in and death occurred on the 13th day.

P. W. B–S.

VERRUGA PERUANA.

MONGE (Carlos M.). Verruga Peruana o Enfermedad de Carrión. [**Peruvian Wart or Carrion's Disease.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 244–252. With 4 figs. on 1 plate. [53 refs.],

This paper contains a general description of Verruga peruana in its grave and mild forms, the condition being regarded as a single entity and not as two diseases, Oroya fever and Verruga peruana. The account of the symptoms and pathological findings, particularly the haematological, is fairly full, but the important section is that in which the author gives his reasons for regarding the two as varieties of one disease. These reasons are: (1) That the geographical distribution is identical ; (2) that Bartonella bodies are found in both ; (3) that the blood-picture is the same ; (4) that when Bartonella bodies are present in the eruptive forms, STRONG's view that the patient is suffering from both diseases is more easily explained by identity than by simultaneous double infection.

H. Harold Scott.

MACKEHENIE (Daniel) & WEISS (Pedro). Contribución al Estudo de la Verruga peruana. [**Study of Peruvian Wart.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 211–220. German summary p. 221. With 2 figs. on 1 plate. [17 refs.]

Verruga peruana has been experimentally conveyed by inoculation to apes, dogs, rabbits, asses, sheep and goats. The authors inoculated two monkeys, species Cebus, with material obtained from a human case, triturated and emulsified in saline. 0·5 cc. was injected into the upper eyelid and in a fortnight nodules appeared having the characters of those found in man. A solution of Isamin blue was then injected into the tissue and the whole subsequently excised, fixed, cut, and stained in various ways. The pathological histology is described with a wealth of detail, corresponding with that given by ROCHA LIMA. The authors maintain, however, that the cells considered to be of two sources of origin, endothelial and the histiocytes or haemohistioblasts of FERRATA (the latter term including the adventitial cells of MARCHAND, the polyblasts of MAXIMOW, RANVIER's clasmatocytes, SAXER cells, and so on) are primarily of the haemohistioblastic type and secondarily differentiate incompletely to endothelial types. In these cells they saw bodies structurally identical with the Bartonella bodies present in the peripheral blood in cases of Oroya fever.

H. Harold Scott.

DA ROCHA LIMA (H.). Verruga peruviana und teleangiektatische Granulome. [**Peruvian Wart and Telangiectatic Granuloma.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 525–538. With 9 text figs.

The relationship of the telangiectatic granulomata from other districts to the lesions of "Peruvian wart" is discussed. The photographs of a case from Honduras are presented, and the histological features of the lesions, examined by the writer, are described and figured. The cells of this angioblastic tumour, apparently of an endothelial nature, showed collections of inclusion bodies which might be either cellular granulations or very minute organisms. These resembled very closely the inclusion bodies observed in the lesions of Peruvian wart. They appear inside the cells either arranged in heaps or distributed throughout the entire protoplasm. The conclusion is drawn that the case described is closely related to Peruvian wart, while the epidemiological factors and the incompletely similar structural appearances are against the absolute identity of the two conditions.

W. Jenkins Oliver.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Boyers (Luther M.), Kofoid (Charles A.) & Swezy (Olive). **Chronic Human Amebiasis. A Review of the Diagnosis and Treatment on the Basis of Encystment in the Liver Area.**—*Jl. Amer. Med. Assoc.* 1925. Nov. 7. Vol. 85. No. 19. pp. 1441–1447. With 6 text figs. [3 refs.]

A careful recapitulation of the clinical data of chronic human amoebiasis, with the suggestion that encystment and subsequent excystment in the liver probably occurs in most cases, the parasite having been carried to the liver through the portal veins. A statement was made to the protozoologists that encystment of *Endamoeba dysenteriae* must occur outside the colon, if one is to account rationally for the clinical behaviour of cases. Six months before this paper was written, routine duodenal drainage was instituted, to secure a check on the liver area, and examinations paralleling faecal examinations were made, under the stimulation of bile salts and salines by mouth. Accurate diagnosis of infection with *E. dysenteriae* has improved (1) when identification of the parasite by cytologic criteria of the encysted stage was substituted for the older method of identification by the motile phase; (2) when serial examination of faeces were substituted for haphazard examinations. Salines have proved useful in bringing to light amoebic cysts or motile forms. This in turn has given place to an even better method—the routine use of bile salts as a cholagogue. This use of bile salts has proved so effective in making demonstrable obscure infections with amoebae that it has aroused suspicion that large numbers of amoebae may be found commonly in the liver area in chronic amoebiasis, and this led to the authors' observations on the size of the liver, sensitiveness of the liver edge and frequency of accompanying gall-bladder symptoms. No faecal or duodenal examination is complete without the use of bile salts with or without a saline.

Light is thrown on failure to eradicate amoebic infection by the authors' results of duodenal drainage. Motile and encysted amoebae were found in the liver area. By analogy the question is raised whether or not they may occur also about the joints (hypertrophic arthritis in chronic amoebiasis) and wherever either intestinal or circulatory stream tends to slow down. Encystment in protozoa generally is often regarded as a protective measure providing for their resistance to desiccative or other adverse conditions. From this point of view one would not predict encystment in the liver region or elsewhere in the tissues. There is, however, another point of view—viz., that encystment is related to the metabolism of the protozoon. It often occurs among free living protozoa in cultures in which food is abundant and no adverse conditions appear to be present. It is possible that encystment may follow a period of abundant feeding, or that it may be a resultant of the interaction of some factors in the protozoon's life-cycle. There is no satisfactory evidence that sexual reproduction occurs in any amoeba, certainly not in any parasitic in man, or that encystment follows syngamy. There is no sound biologic evidence that encystment is primarily a protective device or that it might not occur in the case of *E. dysenteriae* in loci, in the human host, other than the lumen of the colon.

The authors carried out 120 duodenal drainages on 50 patients. These patients, with two exceptions, had a clinical diagnosis of pathogenic amoebiasis confirmed by laboratory diagnosis. They were, mostly, selected for duodenal drainage because each one had shown some refractory feature during or after specific therapy. Eleven of the fifty showed *E. dysenteriae* motile or encysted, or both, in the duodenal drainage. In one case duodenal drainage showed amoebae while none were found in six stools examined serially. Three types of amoebae were found in the detritus of duodenal drainage: (1) motile, (2) encysted, and (3) moribund amoebae. Motile amoebae have been preserved with pseudopodia still extended with ingested leucocytes and erythrocytes in their cytoplasm, and with bacteria in vacuoles—evidences indicative of a normal motile feeding phase in the region from which the duodenal drainage was derived. Cysts in the one, two and four nucleated stages have been found; those with one nucleus most often.

"The evidence for concluding that the amoebas of the duodenal drainage are derived from the liver area is as follows: (1) The clinical signs in the hepatic area; (2) the coincidence of regression with amebas in the duodenal content, following treatment; (3) the inclusion of amebas together with typical gall-bladder débris in mucous strands; (4) the increased facility in finding amebas in stools following the administration of bile salts, and (5) the absence of any evidence from clinical examination or necropsy of infection of the jejunum or ileum, above its lowermost part, by *Endameba dysenteriae*. Amebic hepatitis may, therefore, be hematogenous in origin and attend many, perhaps all, cases of chronic amebiasis."

The authors' therapy consists in the administration of emetine hydrochloride, and emetine periodide or bismuth emetine iodide, together with neoarsphenamin or stovarsol. They also used bismuth subnitrate and an organic iodine preparation (iodo-oxybenzenepyridin sulphonate). Combinations of the above drugs were used because each had been tested singly and the results obtained proved inferior to those which followed from their combined use.

[An abstract does poor justice to a valuable paper which should be read by all those engaged in the diagnosis and treatment of amoebiasis; the authors promise a further paper dealing with their therapeutic methods.]

H. M. Hanschell.

Brug (S. L.). Zur Epidemiologie der Amöbendysenterie. [**Epidemiology of Amoebic Dysentery.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 26–31. With 6 curves in text.

Various workers have shown that in England, Holland, and United States of America, five to ten per cent. of the inhabitants are carriers of *E. histolytica*. In these countries autochthonous amoebic dysentery is rare. Why does infection with the dysentery amoeba lead to dysentery so seldom in temperate and so often in tropical climates? Difference in species of parasite is improbable [*ante* p. 35]. There are no morphological differences to be detected between the tropical and temperate clime forms, and the latter can cause dysentery and liver abscess as well as, if less often than, the former. There are no differences between the clinical symptoms and pathological anatomy of the

lesions in both climates. Moreover, in the tropics one finds autochthonous cyst carriers who show no ill effects from their *E. histolytica* infection. As to the "virulence" of the tropical *E. histolytica*, "virulence" depends on the host as well as on the parasite. If it be that a tropical climate enhances the virulence of *E. histolytica*, it can do so only indirectly through its influence on the host, and in that case this effect of climate should be discernible also in temperate lands. The amoebic dysentery of the temperate zone should be a disease of the hot months. The author has searched the literature for epidemiological data of amoebic dysentery in temperate and subtropical countries. These records, though few, are significant.

JAEGER observed two amoebic dysentery epidemics in the Königsberg garrison August-October 1900, and August-September 1901. The author gives curves of the incidence of amoebic dysentery cases in 1900–01 in the E. Asiatic Expeditionary Corps; of the cases observed by VIERECK in Hamburg (1900–05), WOODCOCK (1917), Suez Canal, JOUVEAU DUBREUIL, Szechuan (1919), LEDINGHAM, Mesopotamia (1917–18); these all show amoebic dysentery to occur mainly in the hotter months. VALLARDI (1917), Macedonia, found amoebic dysentery most frequent in July. GARIN and LÉPINE reported most cases in Lyons occurred in June, July and September and October. SCOTT recorded that in Tientsin new cases of amoebic dysentery were seldom found in winter. For comparison the author gives a curve of amoebic dysentery incidence in tropical Batavia, 1917–24. This shows the great majority of cases occur in August, October and November. The author concludes that climate is the factor that converts a healthy amoeba carrier into a dysentery case, and "climate" is the answer to the question why in cold countries amoeba carriers are common while amoebic dysentery is rare.

H. M. H.

BENTMANN (E.). Die Bedeutung der Dauerformen im Krankheitsbilde der Amöbenruhr. **The Significance of Permanent Forms in the Clinical Picture of Amoebic Dysentery.** —*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 17–26. [10 refs.]

The result of treatment in amoebic dysentery can be judged only by stool examination continued, in the author's opinion, for one year after which the stools should be cyst free. Treatment by emetine and yatren leads to conversion of parasites from the vegetative or active to the encysted state; the formation of active forms ceases. The older vegetative forms, the *minuta* and chromidial forms and cysts play no part in the disease process and therefore are not the objects of treatment. The further development of the treatment of chronic amoebic dysentery must come through pharmacological investigation of the effect of emetine and yatren on tissue regeneration.

H. M. H.

EVANS (Thomas Carey). **The Surgical Aspect of Amoebiasis.** —*Trans. Roy. Soc. Trop. Med. & Hyg.* 1925. Nov. 19 & Dec. 17. Vol. 19. Nos. 5 & 6. pp. 282–299.

This paper deals fully with the complications and sequelae of amoebiasis that call for surgical treatment. Amoebic typhlitis must

be differentiated from acute or subacute appendicitis, by the history of the case and stool examination. It needs conservative treatment only; emetine cases do not stand operation well. Localized chronic infections and thickenings of the large intestine may occur causing symptoms of partial obstruction. If emetine prove ineffective operation is indicated. Chronic ulcerative colitis lasting over two or three months, with anaemia and emaciation, which does not respond to medical treatment, should have frequent lavage of the large bowel through an appendicostomy or valvular caecostomy. Stricture of bowel after amoebic ulceration is rare. It is possible that cicatrization or contraction of the colon not amounting to actual stricture may often be the cause of the bowel derangements following upon amoebic dysentery. Only two cases of successful suture of a perforated dysenteric ulcer have been reported. Severe intestinal haemorrhage, which may be mistaken for duodenal ulcer, may occur; examination of the stools will settle the diagnosis; if amoebae are found, emetine treatment only is required. After amoebic dysentery the sigmoid, or the descending colon, may frequently be palpated as a thin cord or as a hard contracted tube. This may be due to spasm, or to fibrosis, and may lead up to definite diverticulitis. Diverticulitis and sacculation of the large bowel are difficult and intractable "surgical" sequelae of dysentery. Perinephric abscess may result from chronic amoebic dysentery.

Amoebic abscess of the liver is by far the most important sequela of amoebic infection of the gut; it is a preventable condition, and its incidence since the discovery of emetine has diminished considerably—a debt that humanity owes to Sir Leonard ROGERS. The author stresses the importance, for all those likely to meet with amoebic infections, of interesting themselves in acute amoebic hepatitis which, if unrecognized and untreated, invariably leads up to abscess formation. Were this liver condition more efficiently recognized, the necessity for surgical procedure would be entirely abolished. When liver abscess has developed and been diagnosed, preliminary treatment with emetine is essential in all cases. Definite indications for surgical interference are:—

1. Swelling over the liver area.
2. Oedema with pitting on pressure.
3. Progressive enlargement of liver; increased pain and tenderness.
4. Progressive deterioration in patient's general condition.
5. Blood examination showing a polymorphonuclear leucocytosis. (In chronic liver abscess there may be little or no leucocytosis.)
6. Screen examination showing definite shadow, and possibly right diaphragm at higher level than left, with diminution of movement.
7. When pus is actually obtained on exploratory puncture.

The more experience one obtains of liver abscess, the more convinced one becomes that the majority can be dealt with satisfactorily by simple aspiration. But, with a condition so varied in symptoms and pathology, a fair degree of latitude is essential in deciding the best procedure in each instance. The surgeon should remember that 80 per cent. are single abscesses, occurring in the proportion of 5 to 1 in the right lobe of the liver. Exploratory puncture and aspiration is practically limited to abscesses of the right lobe. CANTLIE and MANSON laid down the golden rule that needle or trocar should not be pushed in more than 3½ inches. In every case of effusion or pus in the right chest, the possibility of its connexion with liver abscess should be kept in mind. Amoebic abscess of spleen is rare: repeated aspiration is the method of

choice in dealing with it. Amoebic abscess of brain never occurs apart from liver abscess. Apart from direct extension from the liver amoebic abscess of the kidney has not been recorded. The author has never met with a case of amoebiasis of the genito-urinary system, though such cases have been recorded. [This abstract indicates only some of the points dealt with in a masterly paper, which will well repay reading by all engaged in tropical medicine.]

H. M. H.

VICHREV (P.). Ueber Amöbenruhr. [**Amoebic Dysentery.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 404–420.

An account of the etiology, macro- and micro-scopic morbid anatomy, symptomatology, complications, epidemiology, diagnosis and differential diagnosis of amoebic dysentery as observed by the author in Tiflis. Under differential diagnosis the author notes the frequency of *Amoeba coli* (Loesch). It is non-pathogenic. He has found infection of vagina and bladder with *Amoeba urogenitalis*, whose characteristic movement and "lobopodia" distinguish it from *Amoeba histolytica*. Bacillary dysentery also must be excluded.

H. M. H.

ALESSANDRINI (Paolo). Criteri elementari per la diagnosi della dissenteria amebica. [**Diagnosis of Amoebic Dysentery.**]—*Policlinico.* Sez. Prat. 1925. Nov. 30. Vol. 32. No. 48. pp. 1665–1668.

In this article the author lays stress on the facts, firstly that liver abscess due to *E. histolytica* may arise without any preceding intestinal symptoms, and secondly that it is not safe to argue that the clearing up of symptoms after administration of emetine proves the condition to have been due to *E. histolytica*. Cases with dysenteric symptoms from causes other than the entamoeba may get well, while, on the other hand, there are cases of amoebic dysentery which prove emetine-resistant. It is necessary, for diagnosis, to examine stained smears as well as fresh, and in doubtful cases it is advantageous to obtain intestinal mucus viâ the sigmoidoscope. The remainder of the paper is taken up with descriptions of *E. histolytica*, *E. coli*, *E. nana*, *Iodamoeba* and *Dientamoeba fragilis*.

H. Harold Scott.

BACH (Fritz Werner). Ueber das Vorkommen von Amöbenruhr im Rheinlande. [**The Occurrence of Amoebic Dysentery in the Rhine Country.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 1–9. [37 refs.]

The author describes the discovery and course of amoebic dysentery in the Rhineland. FISCHER recorded cases in Göttingen in 1920, one of them a true autochthonous case without contact with amoebic dysentery cases. Since then other autochthonous cases have been from time to time recorded. The author points out that in the Rhineland (when his paper was written) the inhabitants have among them the black and brown sons of Africa, so that a knowledge of tropical pathology has a local practical significance.

H. M. H.

RUSSELL (Martha N.). **A Case of Amoebic Dysentery contracted in England.**—*Lancet.* 1926. Jan. 30. p. 229.

A woman, aet. 38, had suffered for 3 years from diarrhoea with blood and mucus in stools. She had never been out of England, and none of her associates had suffered from the same complaint. On admission to hospital she was having 6 stools in 24 hours, chiefly mucus and blood, with very little faecal matter. Microscopic examination revealed large numbers of vegetative and encysted *E. histolytica.* The condition completely cleared up under emetine treatment.

H. M. H.

PETZETAKIS (M.). Amöbenerkrankungen der Harnwege und Amöbenzystitis. [**Amoebic Infections of the Urinary Passages and Bladder.**]—*Wien. Klin. Woch.* 1925. Dec. 3. Vol. 38. No. 49. pp. 1310–1311.

The author claims to have been the first to describe acute and chronic amoebic infection of the air passages. He has also cured by emetine a case of amoebic nephritis—reported in 1923. He has further noted cases of amoebic infection of the urinary passages; and in this paper describes and discusses fully two new cases of such infection.

Case I. No previous dysentery. The patient, a male aet. 35 years, suffered from haematuria, with painful and very frequent micturition. In the urine the author found motile, red-cell-ingesting amoebae. No amoebae found in the stools. Emetine was given intravenously and intramuscularly. The urine became clear, frequency ceased, and amoebae disappeared.

Case II. Male aet. 60 years—bloody slimy stools and painful, frequent, bloody urine. Both stool and urine revealed haematophagous amoebae. After emetine treatment these vanished from both stool and urine.

The author notes that FRANCHINI has reported amoebic cystitis occurring in the course of amoebic dysentery. He himself has found amoebic cysts, with two, three and four nuclei, in the urine. He describes the morphology and staining character of these amoebae; they are identical with *E. histolytica*, and he urges that in amoebic dysentery the urine and sputum must be disinfected as well as the stools.

H. M. H.

FRANCHINI (Giuseppe). Casi di cistite amebica. [**Cases of Amoebic Cystitis.**]—*Pathologica.* 1925. Oct. 15. Vol. 17. No. 406. pp. 550–552. [1 ref.]

The author places on record three more cases of urinary amoebiasis occurring in Bologna, thus bringing the total up to five. All three were women, two aged 22 and one 23 years. There was in each a complaint of suprapubic pain with passage of urine containing blood and motile amoebae with included red corpuscles. Cysts also were found in one patient. Treatment with emetine hypodermically and intravenously was adopted, together with local lavage with antiseptics or stovarsol. Urinary amoebiasis was found to be more resistant to treatment than the intestinal form.

H. Harold Scott.

FIORITO (G.). Un caso di cistite da ameba hystolitica. [**A Case of Cystitis due to** *E. histolytica.*]—*Riforma Med.* 1926. Feb. 15. Vol. 42. No. 7. pp. 163–164. [23 refs.]

The author places on record the case of a woman, 41 years of age, who had suffered from amoebic dysentery for about three years. During the last year she showed symptoms of cystitis—frequency of micturition, strangury and pyuria. Examination of the urine by Giusti's method revealed the presence of typical *E. histolytica*, both motile and cystic. He thinks that the intestinal ulceration had favoured the passage of the amoebae to the urinary system by the lymphatic route.

H. Harold Scott.

LINDALL (A. L.). **Liver Abscess. Report of Five Cases.**—*U.S. Nav. Med. Bull.* 1925. Dec. Vol. 23. No. 6. pp. 494–501. With 1 text fig. [3 refs.]

The author gives a full and careful account of his cases.

Diagnosis chiefly depends upon the X-ray findings and the ability to locate flocculent or brick-red pus in the liver with the aspirating needle. The main cause of the high mortality of amoebic liver abscess is due not to the virulence of *E. histolytica* but to procrastination in using the aspirating needle and delayed surgical interference. He quotes JOHNSTON (Ann. Surg. 1897): "Treatment should be prompt, bold, and radical; no measure will succeed which does not completely evacuate the abscess cavity and allow free drainage. This can be done with precision and safety only by incision." The author describes the technique of the retroperitoneal method of draining a liver abscess —by subperiosteal resection of the entire twelfth rib. He claims as one of its very evident advantages that the operation can readily be performed under local anaesthesia. The resected twelfth rib is functionless and the wound passes through soft tissues, thus reducing shock, facilitating drainage, shortening convalescence, and leaving no permanent disability or impairment. The aspirating needle can be used to great advantage in exploring the liver, and above and below the liver and the perinephritic area. The transparent peritoneum, too, permits inspection of the condition of the upper abdominal cavity. Retroperitoneal and retrocaecal abscess, and empyema, if found, can all be dealt with by this route. The cases were treated with emetine hydrochloride.

H. M. H.

RAMIREZ-CORRIA (C. M.). Le tissu connectif dans l'hépatite amibienne aiguë. [**The Connective Tissue in Acute Amoebic Hepatitis.** — *C.R. Soc. Biol.* 1926. Jan. 5. Vol. 93. No. 38. pp. 1641–1642.

A detailed histological study and description of the pale firm nodules in the liver of acute amoebic hepatitis (ROGERS' fulminating abscesses). The report, which is necessarily a cataloguing of varieties of cellular morphology and staining reactions, cannot be well abstracted.

H. M. H.

D'AMATO (H. J.) & ORTUÑO GONZÁLEZ (J.). Una forma poco común de absceso hepático amebiano. **A Rare Form of Amoebic Abscess of the Liver.**]—*An. Inst. Modelo Clin. Méd.* Buenos Aires. 1924–25. Vol. 9. No. 1. pp. 279–290. [18 refs.]

The authors record a case of hepatic abscess without rise in temperature or definite increase in polymorphonuclear cells, but with a rapidly progressing anaemia. Amoebae were not found either in the pus or discharges at or after operation, nor on faecal examination, but the condition is regarded as amoebic because of the results of emetine administration. There was no history of dysenteric attack. The liver was enlarged to 5 fingers-breadths below the costal margin and the abscess situated towards the upper part of the right lobe. At the first blood examination erythrocytes numbered 3,680,000, and leucocytes 14,200 per cmm.; a fortnight later the figures were 2,680,000 and 9,600 respectively, and the polymorphonuclears are stated to have been 66 per cent. in the first count, 59 per cent. in the second. The anaemia progressed to such a degree that two blood-tranfusions were performed at 3 days' interval, after which the abscess was opened and drained. The questions of the origin of the abscess and the cause of the anaemia are discussed and the authors conclude that in subjects of hereditary syphilis an acute exacerbation of an amoebic hepatitis can arise, but that general intoxication need not accompany the condition and therefore there may be no rise of temperature nor any increase of the polynuclear cells. [These conclusions are not quite clear from the account as given; for, first, a count of 14,200 with 66 per cent. polynuclear cells would constitute a polynucleosis; secondly, since the differential enumeration from the figures stated amounts only to 86 in all, not 100, there must be some error either in the count or the transcription; thirdly, though stress is laid, in the conclusions, on the luetic element, it is stated earlier that the Wassermann reaction was negative, but this was disregarded as other signs were present.]

H. Harold Scott.

D'AMATO (H. J.). Hematología de la hepatitis amebiana supurada. (Contribución a su estudio.) [**The Blood in Amoebic Liver Abscess.**]—*Semana Médica.* 1925. Nov. 12. Vol. 32. No. 46. (1661). pp. 1233–1236.

As a result of 55 blood-examinations carried out on 30 cases of amoebic abscess of the liver the author shows that, apart from the bare diagnosis that a suppurative condition probably exists, there are no reliable changes indicative of the amoebic nature of the abscess. In the list given, the red cells varied between a little under 2 million and a little over 5 million per cmm.; the leucocytes between 7,000 and 38,000; haemoglobin between 50 and 90 per cent.; the polymorphonuclears between 55 and 91 per cent., and so on. Speaking generally, there is in most cases some degree of anaemia of the hypochromic type, and a leucocytosis with a relative polymorph increase.

H. Harold Scott.

ARLAND (J. P.). **Observations on a Fatal Case of Liver Abscess.**—*Indian Med. Gaz.* 1925. Nov. Vol. 60. No. 11. pp. 531–532.

The patient gave a history of 10 years' alcoholism. He had had dysentery twice. A tumour was present below the right costal arch. Aspiration confirmed the diagnosis of liver abscess. During operation breathing ceased.

Post-mortem.—Heart and lungs were empty of blood. Intestines deeply congested. The greater part of liver, two-thirds of which had been

destroyed, was represented by a thin capsule enclosing cellular débris. Destruction of the major portion of the liver is compatible with life.

A marked feature of the case was the early onset of intravascular thrombosis throughout the body. The emptiness of heart and lungs may be explained "by the great suction action exercised by the inferior vena cava when it was relieved of the great pressure of the abscess pressing upon it." Stitching liver to abdominal wall to shut off peritoneal cavity is not a safe procedure where the abscess is large and its tissue friable. In aspiration, that part of the needle traversing the abdominal wall is for practical purposes a fixed point, while the part in the friable liver and abscess cavity is not so fixed. With these facts in mind, consider the effect on the liver of respiratory movements. The liver moves up and down during respiration; this motion causes the mobile portion of the needle to tear through the liver and thus favours peritoneal extravasation.

H. M. H.

PANAYOTATOU (A.). Abcès amibien extrapéritonéal simulant l'appendicite (opération, guérison). **Extraperitoneal Amoebic Abscess simulating Appendicitis.**—*Bull. Soc. Path. Exot.* 1925. Nov. 11. Vol. 18. No. 9. pp. 704–707. [2 refs.]

The author remarks that the cases of amoebic abscess hitherto published have been those of involvement of an organ with alteration of its structure (liver, lung, brain, spleen, etc.), or localization in glands. DOPTER reported a case of amoebic adenolymphitis; and the author herself a case of amoebae in a glandular mass in the groin, and a case of amoebic mastitis (abscess). STRONG's cases (12 autopsies) were cases of purulent appendicitis, rupturing into peritoneum; and MORRISON and CRENDIROPOULO's case was an abscess in the perinephric tissue. The author describes a case of perityphlic extraperitoneal abscess, clinically resembling acute appendicitis (with fluctuation), and necessitating surgical intervention. The patient, a male Greek, aet. 40 years, Alexandrian, had suffered from amoebic dysentery 10 years previously; apparent cure by emetine injections, but some mild dysenteriform relapses since, always checked by emetine injections. At operation, on opening abdomen, pus was found in right iliac fossa, but the appendix was entirely normal. The pus contained characteristic *E. histolytica*; the patient's faeces showed *E. histolytica* cysts and dead amoebae. It is notable that in this case, that of perinephric abscess (MORRISSON and CRENDIROPOULO), and the breast abscess (author's), the pus was entirely free of any organism but amoebae. The author believes that encysted amoebae latent in the intestine may from time to time give rise to new amoebae: these may traverse the intestinal coats and become lodged extraperitoneally.

H. M. H.

FIESSINGER (Noël) & PARTURIER (Gaston). Hémoglobinurie orthostatique. Ictère hémolytique. Amibiase urinaire. Cure émétinienne. Guérison. **Orthostatic Haemoglobinuria. Haemolytic Icterus. Urinary Amoebiasis.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1926. Feb. 4. Year 42. 3rd Ser. Vol. 50. No. 4. pp. 153–158. [7 refs.]

By way of introduction to their full account, clinical and pathological, of this case, the authors note that amoebiasis of the urinary system has been known for a long time. It has been described by POSNER (1893)

and BAELZ. There are numerous observations on this matter by KARTULIS, JÜRGENS and WIGNOFF. KOSTER (1918) collected 14 cases. BARTLETT (1917) found them to be common. ARAVANTINOS and MILIARAKIDES (1919) described two cases of amoebic cystitis. Finally PLAZITAKIS (1923) described *E. histolytica* in urine of cases of cystitis without or with haematuria and or urethritis. PEYROT (1924) recorded at Marseilles three cases of amoebic nephritis without any intestinal or pulmonary infection. SIMONIN (1914) recorded a case which, following on dysentery contracted in Morocco, developed multiple independent abscesses of liver and lung, and exhibited haemoglobinuria with high irregular fever for three days. The author's case is different from SIMONIN's. It is a case of orthostatic haemoglobinuria, without any signs of an acute infection, the amoebic nature of which was discovered by accident, in the course of examinations of the urine.

The patient (a male aet. 25 years) suffered from a haemoglobinuria provoked by the erect posture and walking, and ceasing on resting or lying down. No haemolysis could be detected in the circulating blood. The icterus at the haemoglobinuric attacks was without cholaemia and without choluria. There was liver and spleen enlargement. The haemolysis occurred in the renal parenchyma. The author thinks, however, that the parasitic cause of the haemolysis may have been as much in spleen or liver as in kidney. He concludes that the cause of these attacks of haemoglobinuria was amoebic infection. Amoebae were found in the urine. They were plainly *E. histolytica*; and emetine in causing disappearance of the amoebae stopped the haemoglobinuria, and at the same time the icterus and the enlargement of spleen vanished. Probably the amoebae gained entrance via the intestine, though a history of passing enteritis is the only evidence for this. An amoebic septicaemia resulted.

H. M. H.

HAMMERSCHMIDT (Johann). Ueber zufällige Amöbenfunde in der Darmschleimhaut des Menschen. **The Casual Discovery of Amoebae in the Intestinal Mucous Membrane.**—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 148–151. With 4 figs. on 2 plates. [3 refs.]

The author, in 1919, reported finding an amoeba in the rectal mucous membrane of a fatal case of pernicious anaemia. He now records briefly, and illustrates by microphotographs, the finding of amoebae deep in the mucous membrane of the ileum, in two fatal cases of typhoid fever, and in a fatal case of acute leukaemia. The morphological characters of these amoebae, as illustrated in the photographs and described by the author, support his claim that they are *E. coli*. He concludes that *E. coli*, hitherto regarded as only a saprophyte and non-pathogenic, may play a new rôle. If found in the stool of an actual dysentery case it may have some valid etiology for that illness.

H. M. H.

ABELHEIM (A. C.). **A Case of a Liver Abscess cured by Injections of Emetine.**—*Med. Jl. S. Africa.* 1925. Nov. Vol. 21. No. 4. pp. 102–104. With 1 fig.

In March 1914 the patient suffered from dysentery for four weeks. The use of antiseptic enemas was followed by apparent improvement, but diarrhoea from time to time led to the patient's appendix being removed by another medical man. Some improvement followed. In September, 1915, the patient suffered from fever with loose slimy stools and pain in

right shoulder; crepitations at right base and some enlargement and tenderness of liver were found. X-rays showed liver enlargement. The author aspirated the liver in many places, but got no pus. Emetine, ½ gr., was given twice daily for 12 days, and patient made an apparent recovery. Three months later the patient having rejected the author's advice to undergo a further course of emetine injections had a return of the symptoms. Some other medical man diagnosed gallstones and opened the abdomen; nothing wrong was found in abdomen or with gall bladder. The author again treated the patient with emetine ½ gr. for 12 days and recovery followed. Since then, several slight attacks of diarrhoea with hepatic region discomfort have been treated with emetine injections and E.B.I. by mouth. After the last attack patient was X-rayed. The plate revealed a round shadow, 2 inches in diameter, in right lobe of liver. Evidently the abscess had become sterile and calcified. The case, thinks the author, teaches that liver abscess can be cured by emetine injections alone; but these must be repeated at least once, within three months. [The proof of calcification is weak.]

H. M. H.

HODSON (V. S.). **Emetine in the Treatment of Hepatic Abscess.** [Correspondence.]—*Lancet.* 1926. Jan. 16. p. 156.

Dr. Hodson compares and contrasts statements made by Dr. MANSON-BAHR in this *Bulletin* and recently in a paper published by MANSON-BAHR and MORRIS with regard to the rôle played by emetine in the treatment of liver abscess. [See this *Bulletin*, Vol. 22, pp. 5 and 266. Interested persons may consult these passages and form their own conclusions. One extract quoted as MANSON-BAHR's is really FRY's.]

A. G. B.

JOHNS (F. M.) & JAMISON (S. Chaille). **A Note on the Treatment of Amoebic Dysentery with Stovarsol.**—*Jl. Trop. Med. & Hyg.* 1925. Nov. 2. Vol. 28. No. 21. pp. 378–379. [6 refs.]

A preliminary report on 27 cases of amoebic dysentery—published now because their present results of stovarsol treatment are claimed by the authors to be remarkable. The illnesses ranged in severity from chronic, to active, severe, emaciated cases; from a few weeks' to 25 years' duration. Diagnosis was confirmed in all cases by finding entamoebae in stools, or in scrapings obtained through the proctoscope, and always verified by use of wet fixed preparations and by iron-alum-haematoxylin staining of nuclear structure. Except for one patient who received less, doses of 0·25 gm. t.i.d. for one week caused complete subsidence of symptoms; improvement beginning usually on third or fourth day of treatment. After one course, three cases had remained well, and free from entamoebae, 99, 74, and 70 days respectively.

Twenty-four cases received a second course, 7 to 10 days after the first, consisting of three 0·25 gm. tablets per day for seven days, or two tablets for twelve or fourteen days. Twenty of these cases had been followed with clinical, proctoscopic and microscopic examination for an average period of 55 days after end of treatment. Sixteen had remained well and free from entamoebae. Four relapsed, three clinically and one developing cysts. The authors point out that long-standing cases with massive involvement of the bowel walls present the same difficulty of treatment that applies in other tissue-invading parasitic diseases, the parasites being protected by impermeable walls

of exudate and tissue proliferation. No known specific will cure in all instances.

Stovarsol is an arsenical designed by LEVADITI and NAVARRO, to be administered through the digestive tract; it has been the subject of considerable European investigation in the treatment of syphilis. It is partly absorbed through the small intestine, and then excreted through the large. The only untoward effect attributed to it, noticed by the authors, was, dull headache in one case, mild rash in another, and rash with slight temperature in a third. Their experience, so far, indicates that stovarsol is a remedy for amoebic dysentery comparing quite favourably with anything previously employed. Also it is supposedly harmless. [The reviewer would point to the two cases of mild rash and add that stovarsol may produce very severe arsenical exfoliative dermatitis.]

H. M. H.

VAN DEN BRANDEN (F.). Sur quelques cas de dysenterie amibienne traités par le stovarsol. [**Cases of Amoebic Dysentery treated by Stovarsol.**]—*Ann. Soc. Belge de Méd. Trop.* 1925. June. Vol. 5. No. 1. pp. 109–110. [3 refs.]

Stovarsol was given to 8 cases of amoebic dysentery. Two cases relapsed a few days after the finish of treatment and in four cases the amoebae did not disappear from the stools. One of these four was from the start of stovarsol treatment a very severe case with great cachexia, and the other three were "amoeba carriers" very resistant to emetine hydrochloride treatment. In two cases amoebae and symptoms disappeared. The author notes that these results are less brilliant than those reported by MARCHOUX, who introduced stovarsol treatment for amoebiasis, and others. He thinks it may be best to combine stovarsol and emetine treatment.

H. M. H.

RODENWALDT (Ernst). Die Behandlung der Amöbendysenterie mit Yatren 105. [**Treatment of Amoebic Dysentery with Yatren.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 475–484.

In the past critical judgment of therapeutic remedies for dysentery in the tropics has been handicapped by uncertainty of diagnosis. Even to-day the diagnosis of amoebic dysentery is not everywhere assured and the frequency of bacillary dysentery in the tropics not always recognized. The vegetative forms of the dysentery amoeba are often confused with *Amoeba coli*, and if cysts be absent from the stools, the effect of the therapy cannot with certainty be known. The author refers to the introduction of yatren treatment by MUHLENS and MENK, and gives an account of his uniformly satisfactory experience of this remedy in amoebic infections of the gut. Doses of 1 gm., powder, wafer or pill, t.i.d. are borne well by the patient. In severe cases, or in relapses, 9 gm. per diem, per os, can be given. With rare exceptions, yatren masters the attack of dysentery. It is especially in old obstinate cases that yatren procures full recovery, where other remedies had failed. Cysts disappeared in 4 days. There were no relapses. Yatren has apparently no effect on intestinal flagellates, nor on the numbers of helminth ova seen in the stools; its actual

effect on the amoeba is not yet clear. It is desirable when yatren is used in amoebic dysentery, that at the same time the quality and numbers of the intestinal flora be investigated. Where amoebae are present, and there is tissue invasion, it may be that they live in symbiosis with the intestinal bacteria. Such an investigation might throw light on the different courses run by amoebic dysentery cases, and on the results of therapeutic interference in different climates. The author records that TAFEL (S.E. Borneo) had cured three cases of Balantidium infection by yatren. This drug has not long been used in tropical practice, yet already from all countries come reports of yatren cures of severe, one year to ten-year-old, cases.

H. M. H.

KATSURADA (F.). **On the Works of "Yatren" against Amoebic Dysentery. (Preliminary Report.)**—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 178–179.

As introduction the author states that with emetine a permanent cure of amoebic dysentery is not obtained. Emetine induces cyst formation in the amoebae, which become strongly resistant to physical and chemical agents. His experience with yatren had been very satisfactory, amoebae disappearing and not reappearing after, as a rule, 1·8 gm. yatren per diem, for seven days, and sometimes after two or three 0·6 gm. doses of yatren. Further observations on the effect of this drug are proceeding.

H. M. H.

LANTIN (Pedro T.). **Neosalvarsan in the Treatment of Amoebic Dysentery.**—*Jl. Philippine Islands Med. Assoc.* 1925. Sept. Vol. 5. No. 9. pp. 269–275.

A report of 11 cases of dysentery, of 5 months to 12 years duration, whose symptoms and entamoebae disappeared after 1 to 4 intravenous injections of 0·3 to 0·6 gm. neosalvarsan (one case received the drug per rectum). 8 of the 11 had had emetine treatment, in many cases in prolonged courses. Relapses, clinical and parasitic, had occurred in all. In one case there was persistence of symptoms, and cysts and trophozoites in stools, after the neosalvarsan injections. In four cases symptoms and parasites reappeared in from 1 to 19 months after the neosalvarsan injections. The others had all kept well and parasite free. [In some of the cases cysts only are recorded as having been found before the neosalvarsan injections. No apparent steps were taken to exclude syphilis in any.]

H. M. H.

i. HIRAYAMA (Kinzo). [**Yatren Treatment of Amebic Dysentery.**]—*Nihon Fujinkagakkai Zasshi (Jl. Japan Gynecol. Soc.).* 1925. May. Vol. 24. No. 3. [Summarized in *Japan Med. World.* 1925. Dec. 15. Vol. 5. No. 12. p. 365.]

ii. MURADOWA (A. B.). **A Case of Lung Abscess of Amoebic Origin.**—*Russian Jl. Trop. Med.* Moscow. 1925. No. 1–2–3. English summary p. 74. [In Russian p. 69.]

i. The author reported 13 cases of amoebic dysentery treated with yatren and concluded that it was indeed one of the most reliable drugs against this disease.

ii. A brief description of a case in Erivan, Armenia, with *E. histolytica* in the sputum. The patient had had dysentery 3 years previously. [The abstract does not give the data on which the recognition of *E. histolytica* was founded.]

H. M. H.

Bacillary Dysentery.

Vazquez-Colet (Ana). **Contribution to the Question of Dysentery Carriers in the Philippine Islands.**—*Philippine Jl. Sci.* 1925. Oct. Vol. 28. No. 2. pp. 173–192. [18 refs.]

The author is to be congratulated on a careful and valuable investigation.

1. The existence of healthy carriers of *B. dysenteriae* in the Philippine Islands has been demonstrated.

2. The proof was carried out by isolation of cultures which, according to standard methods of identification, proved to be *B. dysenteriae*.

3. In 3,328 examinations, 14 carriers were found, of whom 7 harboured the Shiga type, 6 the Flexner, and 1 both Flexner and Shiga types successively.

4. Agglutination tests were performed with the carriers' sera and with the corresponding culture isolated from the carriers, as well as with stock cultures of the Shiga and Flexner types. Usually the serum of the carrier agglutinated its own strain to a lesser degree than the stock cultures, and at times a considerable inhibition zone was noticed with the carriers' serum and its own strain.

5. All of the cultures belonging to the Shiga type, isolated from the carriers, were pathogenic for white mice, and some of them were strongly toxic to rabbits. The cultures belonging to the Flexner type, isolated from carriers, were found to be of low virulence.

The author states that the nature of dysentery carriers is not well established. It is unlikely that the gall passages are invaded at all by *B. dysenteriae*. Chronic inflammation and eventually ulceration of the large intestine would seem to offer a more plausible explanation for the persistence of the carrier state in bacillary dysentery; the histories and serological evidence in the 10 cases here discussed lend support to this supposition. A study of the distribution of *B. dysenteriae* throughout the intestinal tract of dysentery cases is necessary before a definite idea can be formed as to the organ or organs responsible for the state of dysentery carriers. Systematic bacteriological examination at autopsies would probably throw much light on this subject.

The occurrence of the carriers from April (2 carriers) to May (3), to July (6), to August (2), to September (1 carrier), corresponds well with the annual seasonal outbreaks of bacillary dysentery in the Philippines. The number of carriers appears to increase parallel with the number of cases. The opinion expressed on another occasion (1924) "That . . . the chronic carrier is not as serious a factor in the epidemiology of . . . dysentery as he has previously been considered to be," must be corrected. Once the existence of healthy carriers of *B. dysenteriae* has been demonstrated by laboratory evidence in a relatively high percentage of the food handlers examined, the dysentery

carrier must be considered as a serious factor in the epidemiology of bacillary dysentery, even though he remain undiscovered.

[The author's doubt as to infection of the gall passages with *B. dysenteriae*, and his plea for systematic bacteriological examination at autopsies, receive resolution and backing respectively by Drs. A. CONNAL and E. C. SMITH's findings in the Nigerian case of bacillary dysentery. (See below.)]

H. M. H.

BOASE (A. J.). **A Review of a Recent Epidemic of Bacillary Dysentery with Special Reference to a New Therapy.**—*Kenya Med. Jl.* 1925. Dec. Vol. 2. No. 9. pp. 245–250.

Drs. T. B. WELCH and C. J. MASCARENHAS reported in 1924 that castor oil had greater efficacy in the treatment of bacillary dysentery than the usual saline aperient treatment [this *Bulletin*, Vol. 22, p. 20]. They claimed that so long as the stools showed signs of active dysentery, castor oil in repeated small doses had the following advantages: (1) A greatly reduced death rate; (2) curtailment of duration of symptoms; relapses unusual and mild; (3) prompt convalescence, patients losing little in condition; (4) alleviation of abdominal pain, defaecation not exhausting, and daily number of stools not very large.

The series of dysentery cases here reviewed were divided into two groups.

A. Saline group.—Mag. sulph. 2 drachms every two hours, or twice a day, according to symptoms.

B. Castor oil group. On admission the patient was given 2 ounces of castor oil and on subsequent days 1 drachm hourly for 8 doses until such day (usually the third) as the stools ceased to show blood and mucus. A saline purge was then given to relieve any constipating effect of the castor oil.

	Saline group.	Castor oil group.
Cases treated ...	45	72
Deaths	4 (8·8 per cent.)	2 (2·77 per cent.)
Relapses	9 (20 per cent.)	8 (11·11 per cent.)

The author notes that the number of cases treated was very small; yet, taking the epidemic as a whole, better results were obtained from the castor oil treatment. It has been proved experimentally that the bowel lesions in bacillary dysentery are the result of the bacterial toxins which show a selective preference for the large intestine and the last few inches of the ileum. As a biliary fistula will prevent development of pathological changes in the intestine, the toxins must reach the intestine in the bile. WELCH and MASCARENHAS were led to conclude that retention in the small intestine, if at all prolonged, was a most important factor in the production of intoxication. They found that the death rate among patients on saline treatment rose with the giving of a larger diet, while the small amount, or entire absence for some time, of faecal matter in the patient's stools became even more striking than ever. As a result of this observation, castor oil was exhibited with the special object of preventing delay alike in the small and large intestine. The oil administered in repeated small doses keeps up continuous gentle peristaltic action and the contents of the small intestine are hurried on before appreciable absorption can take place. An important point in the castor oil treatment lies in diet. It is difficult to restrict the diet of the uneducated

native. With routine castor oil treatment all dysenteric patients were allowed full diet—cooked bananas or sweet potatoes, tea, soup, with meat when available, sugar cane, and milk when the supply could meet the demand. No ill effects were noted from this innovation. The bacteriological aspect of the epidemic as reported by Dr. H. L. DUKE showed :—

Cultures	Shiga	2 cases.
	Flexner	3 ,,
	No organisms ...	6 ,,
Agglutinations ...	Shiga	11 cases.
	Flexner	19 ,,
	S. and F. mixed	5 ,,
	Negative results...	10 ,,

H. M. H.

KOETSIER (J. H.) & ZIESEL (H. J.). Eenige mededeelingen over de dysenterie-epidemie te Staphorst. [**Some Notes on the Epidemic of Bacillary Dysentery in Staphorst. (Province of Overyssel, Netherlands.)**] —*Nederl. Tijdschr. v. Geneesk.* 1925. Dec. 26. Year 69. 2nd Half. No. 26. pp. 2856–2861.

The epidemic in Staphorst [a little village of backward habits of personal hygiene, in one of the eastern provinces] commenced July 10th, attained its height in August, and declined in September. Bacteriological examination demonstrated bacilli of the "non-toxic" kind (Flexner, Hiss) as the causal agent. The first cases were among children only and were diagnosed as infantile diarrhoea ; afterwards adults were likewise affected (two-thirds of them women), but always remained in the minority. Fatal cases were few in number, mostly among the aged and the very young. Some 300 cases (among a population of 5,000) came under treatment, but many more were slightly ill without seeking medical aid. The infection spread by direct contact ; water could be excluded as a vector ; flies, on the contrary, were probably of much importance. In the treatment bilivaccin proved of little use, but polyvalent anti-dysenteric serum was applied with great success in some 10, mostly chronic, cases where other methods had failed.

N. H. Swellengrebel.

HILLIARD (E. T.). **Dysentery in Mental Hospitals with Special Reference to the Types of Organism involved.**—*Med. Jl. Australia.* 1925. Dec. 19. 12th Year. Vol. 2. No. 25. pp. 695–698. With 2 charts in text. [3 refs.]

Dysentery has always been endemic in mental hospitals, at times flaring up into epidemics and notoriously resistant to attempts to eradicate it. This is due to faulty habits of patients who have had dysentery ; certain types show a tendency to quiescent periods during which mucus can be demonstrated in the stools ; a relatively high percentage of new admissions to hospital are already affected. The main clinical types are mild, relapsing and toxic. Treatment is by dieting and serum. In 70 per cent. of the acute cases the organism was isolated from the stool and proved to be Shiga 10 per cent., Flexner 30 per cent., Y 30 per cent. The sera of 30 convalescents gave agglutination reactions as follows : Flexner 10 patients, Flexner Y 14

patients, Shiga 6 patients. In recent cases the earliest agglutination reaction appeared on the 16th day of the disease, or 10 days after the clinical symptoms had subsided; by the end of two months it was well defined and persisted. A high degree of correlation existed between the serum reactions and bowel culture findings and the clinical symptoms of the disease. Flexner Y type produces little constitutional disturbance, is almost afebrile, and tends to relapse; Flexner type, more disturbance, moderate fever, and few relapses; Shiga type, severe disturbance and high fever, but no relapses. Flexner and Flexner Y are, therefore, potent aetiological factors in the endemicity of the disease. Among those who had occasional mucus in stools or looseness of bowels at varying periods after the original attack, four yielded agglutination reaction with Y strain and in one Y bacillus was isolated.

Prophylaxis.—The carriers are there. Some are recognized, others undoubtedly missed. It is important to (1) prevent introduction of the disease by 3 weeks' careful observation of newcomers and enquiry concerning previous attacks; (2) prevent patients who have suffered from dysentery being transferred from one to another, especially a newly opened, hospital; (3) isolate promptly all cases of diarrhoea, dysentery and carriers, for as long a period as possible; (4) protect healthy persons by raising their resistance. A Flexner stock vaccine is now under trial.

H. M. H.

WEBSTER (Reginald) & WILLIAMS (F. Eleanor). **Bacillary Dysentery in Infancy and Childhood. Part I. Dysentery Bacilli as recovered from the Motions of Infants and Young Children. Part II. The Serum Therapy of Infantile Dysentery.**—*Med. Jl. Australia.* 1925. Dec. 5. 12th Year. Vol. 2. No. 23. pp. 648–658. With 1 chart in text. [8 refs.]

In Part I. the authors call attention to the fact that the identity of specific infection with *B. dysenteriae* in children is apt to be lost under the loose nomenclature "summer diarrhoea." Moreover, the bacillary dysentery of children is not a disease of the summer months exclusively, although it may assume epidemic proportions at this time. 150 strains of dysentery bacilli were recovered from stools, and 121 of these were classified serologically. All these strains belonged to the mannite-fermenting Flexner group and nine examples of the late-fermenting, serologically-specific, Sonne bacillus are included. The Shiga bacillus is negligible as a factor in infantile bacillary dysentery in Melbourne.

Formalinized, approximately standardized, suspensions of the V, W, X, Y, Z, and Sonne bacilli were used with their corresponding high-titre sera. Both agglutination and absorption tests were applied. The X race of dysentery bacilli did not occur at all. Out of the 121 strains isolated between 1922–25 the percentages of V, W, Y, and Z organisms were 23·9, 46·2, 9 and 13·2. In this 121 are included 9 strains of the Sonne organism, which, however, were only met with in 1922–23. There is little to choose as regards death-rate between the different races of Flexner bacilli.

"Dysentery-like" bacilli were recovered from some stools that were highly suggestive of dysenteric infection.

Part II. The results of serum therapy in children were on the whole disappointing, but this is regarded, from the evidence available, as probably due to the lateness of the administration. In this connexion much depends upon the report of the bacteriologist. MacConkey plates were used, and, by the institution of a specially accelerated procedure, which included agglutination tests, a provisional, but sufficiently satisfactory, report could be given on the morning of the day following that on which the stool was received in the laboratory.

W. F. Harvey.

BRAUER (L.). Die Pathogenese der bazillären Ruhr in ihrer Beziehung zu den klinischen Krankheitsbildern. [**The Pathogenesis of Bacillary Dysentery in its Relation to the Clinical Picture.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 449–460. [2 refs.]

The author discusses this relation, and emphatically states that more decisive in determining the course of the illness and its final result is the power of resistance of the type of human being affected than the peculiar quality or species of the exciting agent. Bacillary dysentery can best be grouped according to the various clinical pictures it produces in different types of man.

H. M. H.

CONNAL (Andrew) & SMITH (E. C.). **Report on a Fatal Case of Bacillary Dysentery in Nigeria.**—*Jl. Trop. Med. & Hyg.* 1925. Nov. 2. Vol. 28. No. 21. pp. 379–381. [1 ref.]

A report giving the clinical history and bacteriological and autopsy findings, in *the first case of bacillary dysentery recorded from Nigeria.*

In 1918, on the return of native troops and porters from the East African campaign, it was decided to investigate fully and systematically all cases of dysentery in Lagos, special efforts being made to secure freshly passed stools from all patients. In 1920, Flexner bacillus was isolated from a war veteran who had served in countries where bacillary dysentery existed. There were, however, abundant *E. histolytica* in the stools and the attack responded quickly to emetine treatment. Apart from this case, the search, though continued practically uninterruptedly and by several workers during the past seven years, had been unsuccessful. No bacteriologically confirmed case had been reported from the Gold Coast or Gambia. BUTLER recorded cases in Sierra Leone in 1919.

The patient, male adult, native of Lagos, died after 7 days' dysentery. No amoebae, cysts, or spined ova were found in stools. Emetine had apparently no effect. A loopful of blood-stained mucus was mixed in 10 cc. peptone and after two hours was inoculated on MacConkey plates. After 24 hours' incubation, colonies of a non-lactose-fermenting organism were obtained. The organism was gram-negative, non-motile, and fermented mannite and glucose without gas formation. It did not produce indol in broth. The patient's serum gave a rapid naked-eye slide agglutination with a known Flexner type of organism, and much slower and less marked clumping with a known Shiga and a known Y type. Post-mortem broth cultures were made from heart's blood, gall bladder contents, urine, and contents of colon. A pure culture of a non-lactose fermenter with properties similar to that obtained from the stools ante mortem

was grown from urine, *gall bladder* and colon. The autopsy and histological findings showed the case to have been one of generalized blood infection of a severe nature with a relatively mild local colon involvement.

The recovery of the bacilli from the gall-bladder leads to a suspicion that this organ may, as in typhoid, harbour the organism for a considerable time (bile carriers).

The case demonstrates that all cases of clinical dysentery in Nigeria need not necessarily be amoebic. Bacillary dysentery in the four West African colonies, if uncommon, yet exists. Though there are no histories of epidemics, conditions climatic and otherwise are not unfavourable to its endemicity. Continued investigation is required.

H. M. H.

FALCÃO (Edgard de Cerqueira). Um caso de dysenteria bacillar, produzida pelo "Bacillo de Shiga-Kruse." [**A Case of Bacillary Dysentery due to the Shiga-Kruse Bacillus.**] —*Semana Medica.* Rio de Janiero. 1925. Dec. 31. Vol. 3. No. 12. pp. 723–731. With 1 chart in text. [1 ref.]

A detailed account of a case of severe bacillary dysentery due to the Shiga-Kruse organism and proving fatal on the 16th day after admission to hospital. The chief point of interest is the temperature, the chart of which for the last ten days is depicted. It was of the sawback type, but subnormal, ranging between 33·8° C. and 37·2° C. till the day of death, when it fell to 32·9° C.

H. Harold Scott.

BROKMAN (H.) & PRZESMYCKI (F.). Badania nad wrażliwoscią osobniczą na czerwonke. Experimentelle Untersuchungen ueber die individuelle Empfindlichkeit für das Shiga-Toxin. [**Researches on the Individual Susceptibility to Shiga Toxin.**] —*Medycyna Doświadczalna i Społeczna.* Warsaw. 1925. Sept.-Oct. Vol. 5. No. 3–4. pp. 247–251. German summary p. 252.

As with diphtheria toxin, so, these investigations showed, intracutaneous injection of Shiga toxin called forth a local reaction by means of which differences in individuals could be established. The serum of human beings who give a negative skin reaction can neutralize the dysentery toxin, while the serum of those with positive skin reaction cannot. Analogous with the Shick reaction—insensitiveness to Shiga toxin signifies insusceptibility to acquiring the disease. The principle of physiological immunity to toxin-forming bacteria is, accordingly, uniform, and depends on the amount of antitoxin formation.

H. M. H.

DAUTWIZ. Ruhrheilstoff-Boehncke bei infektiösen und nicht-infektiösen Darmkatarrhen. [**Boehncke's Dysenteric Remedy in Intestinal Catarrhs, Infective and Non-infective.**] —*Deut. Med. Woch.* 1925. Nov. 13. Vol. 51. No. 46. pp. 1913–1914. [1 ref.]

The author in 4 years' experience of the treatment of dysentery and diarrhoeas with BOEHNCKE'S polyvalent sensitized dysentery vaccine, given by subcutaneous injection, has had uniformly favourable results from this therapy. It can safely be given to children. Castor oil and diet are other items in his treatment. He gives no clinical data. He states that it is all-important that acute diarrhoeas, true

dysentery or otherwise, be treated promptly. The toxaemia accompanying them is dangerous. This general poisoning disappears in about 6 hours after the first injection, with marked improvement of the whole condition of the patient and rapid cessation of symptoms of intestinal inflammation.

H. M. H.

PERRY (H. Marrian). **Laboratory Research on Bacillary Dysentery.**—*Jl. Roy. Army Med. Corps.* 1925. Nov. Vol. 45. No. 5. pp. 345–349.

The author recommends further investigation into: (*a*) The persistence of dysentery bacilli in the faeces of convalescents; (*b*) the value of serum reactions in the diagnosis of the acute and chronic diseases. Tables are given of persistence of bacilli in the faeces, which are worth noting. In the case of chronic carriers of B. Shiga the positive results 4, 6 and 12 months from onset were 77, 19, and 4 per cent. respectively, and for *B. dysenteriae* Flexner 59, 34 and 7 per cent. Reference is made to the important work of CUNNINGHAM on "Latent dysentery," and to the ease with which macroscopic and microscopic examination of the stool can be carried out, when bacteriological examination is apt to yield very irregular results. If only the apparent health of the carrier of dysentery bacilli be looked to, there is a great possibility of the fact of carriage being missed.

Serum agglutinating reactions in dysentery are specially recommended for re-investigation. For these the macroscopic technique should be used and either standardized agglutinable suspensions or formalinized bouillon cultures of standard opacity. It is pointed out that no case of Shiga dysentery, where the bacillus has been isolated, has failed to show specific agglutinins; in mild cases the titre may be as low as 1 in 25. The result may not be so easy to bring out in Flexner dysentery, owing to the existence of a number of closely related strains of mannite fermenting causal organisms in this disease which yet are serologically different. A negative result, therefore, in this form of bacillary dysentery is not of such value as a positive. Apparently "normal" sera, too, may agglutinate Flexner bacilli, but this may be due to a previous mild and unrecognized infection. A serological examination in all cases of chronic dysentery should be made.

W. F. Harvey.

PRIGGE (Richard). Experimentelle Untersuchungen ueber das Gift des Flexnerschen Ruhrbacillus. [**Experiments on the Toxin of the Flexner Bacillus.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1926. Jan. 31. Vol. 105. No. 3-4. pp. 488–494. [16 refs.]

The strain of Flexner bacillus used had a lethal action, by intravenous injection in mice, about half that of a Shiga-Kruse strain. Three preparations were tested—the dried toxin, the wash-water toxin, and a bouillon toxin. The first two of these were prepared according to the method of SUDMERSEN and EAGLETON: A 24-hour culture is suspended in distilled water, heated for 15 minutes at 58° C., and centrifuged at high speed. The deposit and the supernatant fluid are both dried, constituting "dried toxin" and wash-water toxin respectively. The dried toxin had only one-twentieth to one-twenty-fifth the toxicity of the similar toxin from the Shiga-Kruse

strain and the wash-water toxin was one-quarter to one-fifth as toxic. Immunization of rabbits with Flexner dried toxin did not furnish a serum capable of neutralizing that toxin. Moreover, the serum of a rabbit immunized with a living culture of Flexner bacilli did not neutralize the toxic properties of the dried toxin, showing that no "bouillon toxin" had been produced in the culture used. The conclusion is drawn that the Flexner toxin is not a true toxin but an endotoxin.

W. F. Harvey.

ISABOLINSKY (M.) & GITOWITSCH (W.). Ueber Mutationserscheinungen der Dysenteriebazillen Shiga-Kruse. [**Mutation Phenomena of Shiga-Kruse Bacillus.** —*Cent. f. Bakt.* I. Abt. Orig. 1926. Jan. 30. Vol. 97. No. 2-3. pp. 148–152.

The test organisms belonged to the Shiga-Kruse dysentery group. Bouillon and agar cultures of these were kept for 1½ months and for 4 months 11 days in the dark at room temperature, when their characters were tested on a variety of media—ordinary, Endo, Klopstock's nutrose, Capaldi and Proskauer's mannite, and Rothberger's neutral red agar media. These cultures constituted first generation cultures. All types of colony of the first generation, sown on Endo agar, were transplanted to ordinary agar and Endo agar and likewise kept. These constituted the second generation cultures.

The appearances of the colonies of the first and second generations were investigated after sowing, while the bacteria themselves were examined morphologically and in respect of Gram staining. Their biological characters were also determined: Thus, after 1½ months at room temperature, the various types of colony derived from the first generation in bouillon showed coli-like characters—acid on Klopstock's medium and gas development on Rothberger's medium.

The colonies of the second generation, on the other hand, showed deviations approximating more closely to typhoid organisms.

Serologically, second generation Shiga-Kruse organisms agglutinated only at 1 in 100 with a serum of 1 in 8,000 titre. The organisms of the first generation, after 1½ months at room temperature, agglutinated at 1 in 500 dilution, and those which had been kept for 4 months and 11 days at the full titre of 1 in 8,000.

The deduction drawn is that the Shiga-Kruse dysentery bacilli afford, with alteration of external conditions, a whole series of variants of which the first generation approximates in morphological, biological and cultural properties to the *coli* group of organisms and the second generation to the typhoid group.

W. F. Harvey.

ISABOLINSKI (M.) & GITOWITSCH (W.). Zur Frage ueber die Variabilität der Dysenteriebazillen vom Typus Chiga-Kruse. [**Variability of Shiga-Kruse Dysentery Bacilli.** —*Rev. Microbiol. et Epidémiol.* 1925. Vol. 4. No. 3. German summary p. 83. [In Russian pp. 3–8.]

A laboratory culture of Shiga-Kruse type of dysentery bacillus, which had been tested and found not to vary except for a decrease in agglutinability, showed, after keeping for a longer time at room temperature, a cycle of variability. These changes morphologically

and biologically approached closely to the typhoid and coli groups. The greatest change was shown in the agglutinability by serum not specific for itself.

H. M. H.

LACY (G. R.). **A Report of Typical and Atypical** *Bacillus dysenteriae* **Shiga, with Special Reference to Agglutination Reactions.**—*Philippine Jl. Sci.* 1925. Nov. Vol. 28. No. 3. pp. 313–328. [22 refs.]

Of all the dysentery organisms, the Shiga group is that which shows the highest degree of uniformity of character. Studies conducted recently have shown that certain irregularities do occur among the Shiga type bacilli. Lacy distinguishes here more than one serological group.

Forty-five strains in all were tested. The organisms were sown on agar of pH6·0 and suspensions made from 24 hour growths. The suspension was heated for 60 min. at 56° C., and kept for use, without preservative, at a temperature of 6° to 10° C. Rabbits furnished the testing agglutinating sera after 4 intravenous inoculations, at 7-day intervals, of successive doses, each of which was double the previous dose. Blood for serum was drawn off 7 days after the last inoculation.

The results of testing the strains were :—

1. Cultural. No differentiation.

2. Biochemical. Indol was the only differential character. Typical *B. dysenteriae* Shiga produces no indol.

3. Pathogenicity. All strains were pathogenic, some in greater, others in less degree.

4. Agglutination. Macroscopic test ; serum dilutions 1–100 to 1 12,800 ; reading after 18 hours at 37° C. There emerged 3 groups, a large (27) and a small (9) differentially agglutinable group, and a small (9) inagglutinable group. None of the strains of the inagglutinable group could be rendered agglutinable by treatment.

5. Adsorption. These tests showed the same clear-cut differences as between the two agglutinable groups.

6. Protection. This was afforded in high degree for all the three groups of living organisms, administered intravenously, by a polyvalent anti-dysentery serum, administered intraperitoneally.

W. F. Harvey.

NAKAMURA (K.). Zur Biologie der in künstlichen Nährböden gezüchteten Shiga-Kruse-Bazillen. [**Biology of Shiga-Kruse Bacilli on Artificial Media.**]—*Cent. f. Bakt.* I. Abt. Orig. 1925. Oct. 10. Vol. 96. No. 3-4. pp. 213–219. [15 refs.]

The biological characters of the Shiga-Kruse bacillus here investigated were those of ammonia assimilation and agglutinability, under varying conditions of artificial growth. In order to test ammonia assimilation after subjection to these conditions, it was determined whether the organism would grow freely in a medium where ammonia was the sole source of nitrogen. Nakamura used a Shiga strain which grew freely upon an ammonium lactate medium in his experimentation on the result of culture in animal fluids. The research is summarized as follows : (1) No loss of ammonia assimilation is evident from

cultivation in fresh and inactivated normal rabbit serum ; (2) a loss of agglutinability results after a series of passages in fresh and inactivated normal rabbit serum. The capacity, however, for fixing agglutinin remains intact, although the bacilli have become difficult to agglutinate ; (3) Shiga-Kruse bacilli which have been long cultivated in ammonium lactate media may lose their agglutinability altogether. Such bacteria fix no agglutinin, nor can they act as antigen for the development of agglutinin in the animal body. These, then, represent truly inagglutinable organisms, although other cultural characters remain unaltered.

W. F. Harvey.

TANAKA (Iwao). Ueber die Ruhrbazillenstaemme, die Mannit zu vergaeren nicht imstande sind. **Strains of Dysentery Bacilli that do not ferment Mannite.** — *Scientific Reports from Govt. Inst. for Infectious Diseases.* Tokyo. 1924. Vol. 3. pp. 1–10. [25 refs.]

Fifteen strains, which did not ferment mannite, were selected from 106 strains of dysentery bacilli available. These strains corresponded in form and cultural properties to the dysentery bacilli which are already known. They were tested for production of indol, and for virulence on mice. The main investigation was of their power to ferment carbohydrates, of which 16 were used in test. They are differentiated from Shiga bacilli by their power to ferment arabinose and maltose.

As a result of the testing, two groups emerged : Group 1 included those which fermented dextrose, laevulose, galactose, mannose, and arabinose. Group 2 was formed by those which fermented maltose (dextrin and starch) in addition. A third group is added to these, extracted from the literature on the subject, consisting of organisms which ferment dextrose, laevulose, galactose, mannose and rhamnose.

W. F. Harvey.

MÜLLER (Léon). Milieux pour la recherche des bactéries du groupe typho-dysentérique. **Media for the Investigation of the Bacteria of the Typho-dysenteric Group.** — *C.R. Soc. Biol.* 1925. July 17. Vol. 93. No. 25. pp. 433–436. [2 refs.]

Modifications of new media, previously published by the author, are here described. They give, in his hands, remarkably constant results in the diagnosis of infections or of carriers. The description of these media is as follows :—

Differentiation Medium.—(1) Prepare : Peptone 15 ; di-sod. sulphate 2·5 ; pot. chloride 2·5 ; Lablemco Liebig extract 10 ; water 1,000 ; with reaction pH 7·6. (2) Add 3 per cent. agar. (3) Heat 60 min. at 106° to 108° C. (4) Decant, for use, the clear part without filtering. (5) Mix with 1 litre of this agar medium at 55° to 65° C. (*a*) 100 cc. 25 per cent. lactose, sterilized 30 min. at 100° C., (*b*) 20 cc. carbolized pot. tartrate (Merck) solution containing 20 gm. tartrate and 2 cc. liquid phenol to 100 cc. water, (*c*) 20 cc. 20 per cent. ferro-cyanide solution.

On this medium, without any colouring matter, colonies of *B. coli* appear greenish blue, whilst the pathogenic coliform organisms, the typhoid and dysentery group organisms, are grey with a tinge of yellow.

Enrichment Medium. (1) Sterilize 10 gm. calc. carbonate, of the lightest variety obtainable, in the autoclave. (2) Add to the sterilized calc. carbonate 90 cc. of Lablemco Liebig bouillon prepared as above, but of pH 7·4, and 10 cc. sterile pure 50 per cent. sod. hyposulphite solution, all well cooled. (3) Shake thoroughly to mix. (4) Distribute the medium in amounts of 10 cc. into tubes or small flasks. (5) Add to a series of these tubes or flasks varying quantities of sterile iodine-iodide solution (25 per cent. iodine, 20 per cent. pot. iodide), such as 0·2, 0·25, 0·3 cc. (6) Mix immediately. (7) Sow 2 drops of the test stool, diluted 1 in 20, in the iodized tubes or flasks. (8) Incubate 16 to 20 hours. (9) Sow after incubation on plates of the above-described differentiation medium.

The elimination of *B. coli* is generally complete in the case of *B. paratyphosus B.* with 0·1 iodine and in the case of *B. typhosus* with 0·15 to 0·2. With the higher dosage of iodine, if there is no growth after 24 hours, it is possible to obtain, when present, a pure culture of *Enterococcus* (*Str. faecalis*) after 48 or 72 hours' incubation.

W. F. Harvey.

VAZ (Eduardo). Immunização per os contra o B. de Shiga. Contribuição ao estudo da natureza da immunidade. Immunisation *per os* contre le bacille de Shiga. Contribution à l'étude du mécanisme de l'immunité.—[**Immunization per os against Shiga's Bacillus.**]—*Mem. Inst. de Butantan.* 1925. Vol. 2. No. 1. pp. 99–116. French summary pp. 117–119. [19 refs.]

The author adheres to the views regarding immunity put forward by BESREDKA—an immunity which is of generalized character, but of local origin, and due to the immunization of a definite organ or area. The research was carried out with the Shiga bacillus and stress is laid upon the importance of choosing that strain for immunization which shall be as little toxic and as highly antigenic as possible. The experiments on immunization *per os* were made with this strain, in rabbits. The rabbits were given 3 or 4 increasing doses of dead bacilli at intervals of 2 or 3 days. The test of protection was made with living organisms, 14 days or more after the last immunization dose, by oral, subcutaneous, or intravenous administration. At the same time the neutralizing and agglutinating powers of the sera of the immunized animals were tested *in vitro*. The conclusions drawn are :—

1. General immunization of rabbits can be effected *per os* with dead Shiga bacilli, although many deaths take place during vaccination and before test.

2. Death takes place by intoxication, as judged by loss of weight, symptoms of dysentery, and lesions produced : the degree of intoxication is dependent on the original condition of the animal (especially as regards coccidiosis), on the dose, and on the strain used.

3. Two strains, I.O.C.1 and Fujimoto, gave a high degree of immunity against tests made by oral, subcutaneous, and intravenous administration.

4. With the development of immunity, the serum of the animal shows antitoxic but not agglutinating power.

5. In the absence of antitoxic power of the serum there is no immunity, either local or general, even by the buccal route.

W. F. Harvey.

OTTEN (L.) & KIRSCHNER (L.). Orale vaccinatie tegen bacillaire dysenterie. [**Vaccination by Mouth against Bacillary Dysentery.** — *Geneesk. Tijdschr. v. Nederl.-Indië.* 1925. Vol. 65. No. 5. pp. 608–623. [13 refs.]

The authors draw the following conclusions from their experiments :—

(1) It is possible to immunize rabbits against dysentery (Shiga) by oral administration of killed bacilli.

(2) This oral vaccination causes an immunity against parenteral as well as enteral infection, stronger than the immunity obtained by subcutaneous vaccination, at least if large quantities are administered (50–100 times the subcutaneous dose).

(3) The serum contains antitoxins and after repeated oral dosage shows an increasing agglutination titre, which does away with BESREDKA's principal argument in favour of local immunity of the intestinal wall.

(4) For appraisement of the practical value of this method of vaccination its application on a large scale is necessary.

W. J. Bais.

KRAUS (R.), AWOKI (T.) & KOVÁCS (N.). Dysenteriebazillus Shiga-Kruse. Ueber aktive Immunisierung mit atoxischen Kulturfiltraten. II. Mitteilung. **Active Immunization against Shiga-Kruse Bacilli with Atoxic Culture Filtrates. No. 2.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. Oct. 31. Vol. 45. No. 1. pp. 42–48. [8 refs.]

An introduction draws attention to the original work of EHRLICH on toxoids and of those who subsequently used these, instead of toxin, for immunization purposes. A reference is made, in passing, to the use of the word "anatoxin" by RAMON. The authors consider that toxoids may not only develop from toxin, but may also be found as a stage *preceding* the actual formation of toxin. In their own investigations they have used atoxic filtrates (paper) of Shiga-Kruse bouillon cultures (24, 47, 72-hr.) intravenously and subcutaneously and succeeded in protecting rabbits against intravenous injection of several lethal doses of toxin.

Thus rabbit 104 received 1 cc. atoxic filtrate intravenously and 7 days later still, 0·5 cc. toxin subcutaneously. The rabbit survived. This is only one of four experiments given.

That the survival under these circumstances was a specific effect is supported by this experiment : Two rabbits were each inoculated subcutaneously with 1 and 3 cc. of the filtrate of a 3-day old Flexner bouillon culture at an interval of 7 days. They were then given, 9 days later, 0·2 cc. Shiga-Kruse toxin intravenously and died in 24 hours. The Flexner filtrate did not protect against Shiga-Kruse toxin.

The toxoid filtrate would appear to be antigenic not only against toxin, but also against infection by living organisms.

Rabbit 122 received 1 cc. of toxoid (atoxic) filtrate intravenously and 7 days later 5 cc. subcutaneously. Seventeen days after the last inoculation it received 0·1 cc. toxin intravenously and survived. Twelve days later still a subcutaneous injection of 0·5 cc. suspension of a living culture of the Kruse-Shiga bacillus was given subcutaneously and the animal survived this injection likewise. The control rabbit died in 48 hours.

This last experiment suggests the utility of atoxic dysentery filtrates for prophylactic immunization. The views of the authors are summarized as follows: "In the formation of certain bacterial toxins atoxic stages develop (protoxoid), which can produce active antitoxic immunity and which may be used for both therapeutic and prophylactic purposes."

W. F. Harvey.

MEYER (Kurt). Zur Kenntnis des heterogenetischen Antigens in Shiga-Bazillen. [**Heterogenetic Antigen of Shiga's Bacillus.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1925. Nov. 25. Vol. 45. No. 2. pp. 97–110. [12 refs.]

The author in this article refers to work already published under his direction by FUJITA, which demonstrated the production of a highly potent serum-haemolysin for sheep's erythrocytes from the immunization of rabbits with Shiga dysentery bacilli. It has recently been contended by H. SCHMIDT that this haemolysin is of a non-specific character, but this view is strongly contested by Meyer and the experiments given are devised with this object. In particular, it is differentiated from the normal haemolysin contained in rabbits' blood and from the haemolysin which is obtained by the injection, as antigen, of the organs of guineapigs. As one example of the specific character of the haemolysin we may give the technique used by the author to demonstrate absence of effect upon haemolytic power of absorption of the Shiga haemolysin with staphylococci:—

(1) Keep a mixture of 1 in 10 dilution of the haemolytic serum and a thick suspension of killed (30 min. at 60° C.) staphylococci for 30 min. at 37° C. and then for 30 min. at 0° C. (2) Centrifuge the mixture. (3) Set up descending quantities, 0·15, 0·1, 0·07, 0·05, and 0·03 cc. of the supernatant clear fluid with 0·25 cc. 5 per cent. sheep blood and keep for 30 min. at 0° C. (4) Centrifuge the mixture and remove the supernatant fluid. (5) Suspend the deposit in 1 cc. normal salt solution. (6) Add 0·25 cc. 1 in 10 dilution of complement. (7) Keep 30 min. at 37° C. (8) Read the haemolysis.

The result was that no evidence of any absorption of haemolysin by the staphylococci was demonstrable. Ten strains were used in the experiment.

Other experiments bearing on the specificity of the Shiga haemolysin are described. The summary of the work reads as follows:—

In the immunization of rabbits with Shiga-dysentery bacilli heterogenetic sheep blood haemolysins develop with great regularity, and to an extent which is not manifested with other bacteria, even of allied species. This haemolysin has the peculiarity that it does not combine extremely readily with sheep erythrocytes and is differentiated thereby from the heterogenetic haemolysins of organ-antisera and the haemolysins of normal sera. On the other hand, this haemolysin is energetically fixed by Shiga bacilli to a high degree, and is strongly bound.

W. F. Harvey.

SCHLOSSBERGER (H.) & HARTOCH (O.). Weitere Untersuchungen ueber die Wertbestimmung des antitoxischen Dysenterieserums. [**Evaluation of Antitoxic Dysentery Serums.**]—*Deut. Med. Woch.* 1925. Nov. 6. Vol. 51. No. 45. pp. 1854–1855. [5 refs.]

The view held by the authors is that dysentery toxin is a single toxin and not a mixture of ecto- and endo-toxin. Moreover, their

determinations of the potency of antitoxic dysentery sera were deliberately carried out after the manner of EHRLICH for diphtheria and tetanus sera, where a preserved standard serum is used as the measure. Toxins of four different kinds were used in the tests, toxin dried according to the English method, wash-water toxin, so-called "whole" toxin and bouillon toxin. The tests showed that dysentery toxin, like other toxins, contained toxoids in varying amounts thus :—

	Lethal dose for mouse.	German standard serum required to neutralize 5 M.L.D.
Dried toxin, English ...	0·02 mgm.	1–500 cc.
Dried wash water toxin ...	0·8 ,,	1–500 ,,
"Whole" toxin	0·1 ,,	1–350 ,,
Bouillon Toxin (German test toxin)	0·125 ,,	1–160 ,,

The antitoxic sera which were compared were : English standard serum C.950, Japanese standard serum 128, and the German standard serum. All four of the above named toxins were put up against each of the standard sera and the method of procedure was as follows : The L+dose of each toxin was determined by reference to the German standard serum and each of these doses was used throughout for evaluation of the potency of the English and Japanese sera, with the result that the relative potencies of English, German and Japanese standard sera worked out consistently for each of the 4 test toxins at approximately 1 : 3 : 128. This gives the values in international units as :—

1 cc. fluid English standard serum, C 950	=	about 12 to 15 international units.
1 cc. German standard serum solution	=	about 40 international units.
1 cc. Japanese standard serum solution	=	about 600 international units.

These experiments show well that standardization of dysentery sera can be effected with any toxin, through the medium of a preserved standard antiserum of constant potency.

W. F. Harvey.

PERUZZI (Mario). La *Vibriothrix zeylanica* (Castellani) nei dissenterici di Pola. [*V. zeylanica* **in Dysenterics at Pola.**]—*Ann. di Med. Nav. e Colon.* 1925. Sept.–Oct. Year 31. Vol. 2. No. 3–4. pp. 141–158. With 36 figs. on 3 plates. [10 refs.]

The author isolated from 13 cases of dysentery an organism which was sent to Dr. CASTELLANI for identification, and it was found in each case to be the *Vibriothrix zeylanica* (Castellani). A minute account of this organism is given describing particularly its polymorphism—undulating, vibrio-spirillar, filamentous and branching, club-shaped and spherical forms. 1½–2 loopfuls of a 48 hours' culture on glucose-blood-agar, emulsified in saline and injected intraperitoneally, killed guineapigs of 350 gm. weight in 30 hours. Half this dose caused toxic symptoms and loss of weight, but the animal survived and had developed immune bodies in 10 days. The paper is embellished with microphotographs of the organism in its varied forms.

H. Harold Scott.

Mixed and Unclassed Dysentery.

Haughwout (Frank G.) & Callender (George R.). **Dysentery: its Diagnosis and Management through the Microscope.**—Reprinted from *Internat. Clinics.* 1925. Vol. 2. Ser. 35. pp. 103–140. With 32 figs. on 17 plates. [31 refs.]

An abstract must fail to do justice to this well-planned and well-illustrated monograph, containing the clearly presented fruits of a wide and critically informed observation, clinical, microscopical and pathological, at first hand, of bacillary, amoebic and balantidial dysentery in the Philippines. Its authors, and the service to which they belong, are to be congratulated on their work, which entirely deserves the attention of the medical profession in every clime.

Part I deals with the pathology of the dysenteries. It is thorough and instructive. It must be noted that, after an attack of bacillary dysentery, in the healing of the ulcers sometimes islands of gland tissue are buried beneath the surface. The glands secrete forming cysts which project as translucent mounds containing thin watery fluid. *Dysentery bacilli have been found in these cysts*; thus explaining one cause for bacillary dysentery carriers. [Among this disease's effects *outside* the intestinal tract, synovitis of joints is not mentioned.] The microphotographs illustrate clearly the essential points in the morbid histology and tissue invasion which occur in the three dysenteries, and which the authors expound in the accompanying text. These pathological findings fit in with and give gross and microscopic anatomical proof for the distinctive microscopical pictures of the stools in bacillary and protozoal dysenteries respectively which are in turn dealt with in—

Part II. Differential Diagnosis of Dysenteries (Haughwout).

Manson (1914), is quoted:—

"Amongst tropical diseases the group of morbid conditions included by the general term 'dysentery' ranks in importance next to malaria." This is just as true to-day. The successful management of dysentery depends almost entirely on accurate diagnosis at the onset of the disturbance. Efforts to determine the type of dysentery on purely clinical grounds will be attended by an incidence of error so great that correct diagnosis is the result of pure chance. Over 10 years' experience has convinced Dr. Haughwout that it is safest for the clinician to make a *presumptive* diagnosis of dysentery, and proceed without delay, not to treatment, but to microscopical investigation to find out what type of dysentery be present, and *only then* institute appropriate treatment. The clinician is faced with three problems:—

(1) That the disturbance is actually dysentery and not some other acute but non-dysenteric process.

(2) Is it bacillary, amoebic, or balantidial dysentery?

(3) The prompt, sustained, adequate application of appropriate treatment, with due attention to any concomitant condition, and a watchful eye for possible sequelae.

These three conditions very closely divide the responsibility for the outcome of a case between microscopist and clinician.

Clinical diagnosis is subject to error because—

(1) Many Flexner type bacillary dysenteries run a relatively afebrile non-toxic course, and may, therefore, easily be mistaken for amoebic dysentery. If treated as amoebic, not only does the bacillary process

run unchecked to a possible fatal end, *but emetine administration to a toxic patient may cause serious cardiac symptoms.*

(2) In protozoal dysentery an accompanying affection may cause fever, which may be attributed to the dysentery, and lead to an erroneous diagnosis of bacillary dysentery. Antidysenteric serum of itself does no harm to such patients, but it has no effect on the amoebic infection. The subsidence of the latter during the rest and dieting of the patient leads to supposed "cure." Such patients relapse.

(3) The macroscopic appearance of the dysenteric stool presents no character that can be used confidently in differential diagnosis.

Bacteriological diagnosis has practical objections :—

(1) Uncertainty in isolating the bacillus from the stool ; this increases directly and rapidly as time elapses between passage of stool and its inoculation upon culture media. It is very hard to cultivate the bacillus in the late stages of the disease.

(2) In general practice it is usually impossible to furnish the bacteriologist with fresh enough material.

(3) It is impossible to secure conclusive bacteriological results under 36 hours. By that time the disease may have proceeded to a point where specific treatment is of no avail.

(4) No dependence whatever can be placed on serological examination of the patient's blood : agglutinins for the dysentery bacillus are not developed for several days after onset of illness ; and it has often been noted that serum of individuals who give absolutely no history of dysentery may agglutinate the organism in fairly high dilution.

(5) Negative bacteriological results may be (and have at time disastrously been) interpreted as positive amoebic findings, by so-called process of exclusion.

This discouraging outlook brings one to the final resort.

Microscopic diagnosis rests on two principles harmonizing with the morbid anatomy pictures already presented.

(1) Knowledge of the pathology consequent on invasion of gut wall by a specific bacterium ; by *E. histolytica* and *Balantidium coli.*

(2) Ability to identify the tissue dwelling forms of *E. histolytica,* and to recognize the rarer parasite *Balantidium coli.*

The dysentery bacilli cause phenomena in the tissues characteristic of intense inflammatory reaction to bacterial infection accompanied by manifestations of toxic necrosis. On the contrary, tissue reactions produced by amoeba and balantidium are mild. There is no evidence that they can produce either inflammatory reactions or toxaemia. All these appropriate phenomena are apparent not only in sections of the dysenteric gut, but may be demonstrated on the surface of the mucosa as well. The appearances on the surface of the mucosa are transferred to the outer world in the dysenteric movement where they are revealed to the microscopist : as truly as he can determine the type of dysentery by the study of stained sections of the gut, so can he do the same by study of its replica—the dysenteric exudate. This gives the basic principle, and evidence of its reliability, to the differential cyto-diagnosis of the dysenteries. MANSON-BAHR (1910) appears to have been the first worker to point out the diagnostic significance of the exudate in bacillary dysentery ; WILLMORE and SHEARMAN (1918) first gave comprehensive exposition of the subject. *The criteria for cyto-diagnosis are available in bacillary dysentery from the early onset of the illness. Diagnosis can, therefore, be prompt and many an attack*

aborted by one or two small injections of serum: moreover, serum administered after the third or fourth day is usually much less efficacious.

Unlike bacillary, acute amoebic and balantidial dysenteries are not as a rule in full swing until 2 or 3 days after the premonitory symptoms —thus allowing ample time to demonstrate the organisms in the stools. If the case be old numerous leucocytes will be present as an expression of the chronic secondary suppurative process.

Bacillary dysentery.—In the acute stages, the elements composing the exudate are constant and afford criteria upon which judgment can be based in interpreting other intestinal exudates. WILLMORE and SHEARMAN summarized the characters of the bacillary dysentery exudate as follows :—

" (1) Abundance of cellular exudate, mostly polymorphonuclear.

" (2) Preponderance of polymorphonuclears over mononuclears.

" (3) Evidence of toxic necrosis of cells, the degenerative changes occurring early in all parts of the cell, including the nucleus. This degeneration may go so far as to leave only the circular periplast of the cytoplasm, thus constituting the 'ghost cell,' the presence of which in any quantity is very typical of bacillary infection.

" (4) Evidence of phenomena characteristic of intense inflammatory reaction to microbic infection."

These points are well illustrated by the photographs in this paper. Faeculent condition of the stools is an indication of convalescence. Very many, on examination of mucus scraped off them, reveal pus and epithelium. Such case is not cured, even though the stool be scybalous, temperature normal and general condition extremely good. The key to the situation is held by the microscopist.

Amoebic dysentery. Here again WILLMORE and SHEARMAN summarize the characters of the exudate as :—

" (1) Scantiness of cellular exudate, especially the polymorphonuclear element.

" (2) Preponderance of mononuclears over polymorphonuclears.

" (3) Evidence of proteolytic digestion of cells, beginning at the periphery and affecting the nucleus last.

" (4) Absence of all phenomena characteristic of inflammatory reaction, toxic necrosis and consequent autolysis."

If a massive purulent exudate is present in bowel discharge that contains tissue dwelling forms of *E. histolytica*, it means one of three things :—

(1) A superimposed bacillary dysentery: search will then reveal ghost cells and other evidence of toxic necrosis. The bacillary process must first be treated and the amoebic only when all danger of giving emetine to a toxic subject has subsided.

(2) A profound bacterial invasion of amoebic ulcers in an old chronic case. Search will reveal no macrophages, ghost cells, or other evidence of bacillary process.

(3) A concomitant medical or surgical condition—tuberculosis, neoplasm, fistula, anal fissure, or broken down haemorrhoids.

This is the Law and the Prophets, that no diagnosis of amoebic dysentery should ever be made unless the microscopist has demonstrated the presence of the tissue dwelling forms of *E. histolytica* containing red blood corpuscles. Precystic or encysted forms alone present mean simply that the patient is a carrier, and may or may not at some future date develop dysentery or liver abscess. To the above picture of the exudate one feature should be added, first described by ANDERSON (1921) and here named *Anderson's phenomenon*: a

clumping of erythrocytes in twos and twenties or more. It is extremely characteristic of exudates in the acute stages of the disease, and never seen by the authors in any condition other than amoebic dysentery. Charcot-Leyden crystals also suggest amoebic infection. Final judgment, however, should be based only on demonstration of the amoeba. Here, again, the photographs clearly illustrate the above essential points in the cytodiagnosis.

In *Balantidial dysentery* microscopic cytodiagnosis depends on finding the organism, and in noting the absence of ghost cells, macrophages and the other appearances so marked in bacillary dysentery. Epithelial cells are present. In any doubt, it is best to treat the case with antidysenteric serum, especially as there is no remedy of proved efficacy against balantidial infection.

Part III. *Treatment and Management of Dysentery, and the Post-Dysenteric State.* (Callender & Haughwout.)

MANSON (1914) wrote :—

"As a rule . . . it is the sequelae of the disease that we have to fear rather than the disease itself. The chronic ulceration, the scarring, thickening and contraction of the gut are irremedial conditions which too often, after months or years of suffering, lead to intestinal obstruction or, very frequently, to atrophy of the glandular and absorbent system of the entire alimentary tract, general wasting and fatal asthenia."

The authors declare this an admirable thumbnail sketch of the pathology of the post-dysenteric gut. Dysentery is a disease of poverty. The mortality is always greater in Shiga than in Flexner cases. It is always very dangerous to young children and the debilitated. Nearly every case of dysentery leaves in its train ulcerative processes (the presence of which microscopic investigation of the stool will reveal by its cellular content), kept alive by organisms other than the one that initiated the trouble. Repeated examinations of stools should, therefore, be carried out for several weeks after the patient has been discharged from treatment. More and more is it evident that on *microscopist, not clinician, rests the final pronouncement of cure.* This is true for both bacillary and amoebic dysentery. The serum treatment of bacillary dysentery now ranks as therapy next only to diphtheria antitoxin. Like the latter, it must be administered as early as possible.

The treatment and dieting of bacillary and amoebic dysenteries are fully dealt with : the monograph concludes with an account, illustrated, of the microscopic evidence of post-dysenteric ulceration of the colon.

H. M. Hanschell.

MANIFOLD (J. A.). **Important Features in the Correct Diagnosis of Dysentery in India. (A Preliminary Note on Ten Months' Experience of Dysentery in Poona.)** – *Jl. Roy. Army Med. Corps.* 1926. Feb. Vol. 46. No. 2. pp. 81–98. [6 refs.]

(1) Of 573 cases of dysentery, 479 were protozoal, 16 bacillary, the rest unclassified. (Report on Health of Army in India 1922.)

(2) Of 318 dysenteries among British troops, 303 were protozoal, 6 bacillary, 9 unclassified.

Of 172 dysenteries among Indian troops, 151 were protozoal, 5 bacillary, 16 unclassified. (Southern Command Statistics for 1923.)

(3) CUNNINGHAM (1923) found 86 per cent. of dysenteries in jails of Eastern Bengal to be bacillary, and that the same proportion held for Moplah prisoners in the Madras Presidency. ACTON and KNOWLES found during 1920–23, in Calcutta, bacillary dysentery at least five times as common as amoebic.

After this telling introduction, Major Manifold continues: "The above three quotations illustrate well the discrepancy which exists between military reports and the views of experienced civil workers regarding the incidence of bacillary and amoebic dysentery in India." (*cf.* Major Knowles BONEY, below.) In these diseases correct treatment is impossible without correct diagnosis, and incorrect treatment results in damage to the walls of intestine, chronic ill-health and sometimes even death. The author's ten months' investigations in *Poona and district* has proved that *bacillary dysentery is extremely common and widespread, far more so than amoebic dysentery.* The prevailing idea was the reverse of this, due to the fact that medical officers in charge of laboratories are not yet trained to distinguish correctly between the different dysenteries. Workers on these diseases in various parts of the East, including India, such as WENYON, ACTON, KNOWLES, ANDERSON, CUNNINGHAM, MANSON-BAHR, have shown that bacillary and not amoebic is the preponderant type of dysentery.

1. Major Manifold gives an interesting account of his own investigations, with details of the methods to be pursued to arrive at an accurate diagnosis, and the organization of medical service in dealing with dysentery which will ensure prompt and accurate microscopical and bacteriological diagnosis. A point of practical value noted by the author is that in bacillary dysentery the stool is alkaline, in amoebic acid.

He concludes that (1) In Poona, among the military population, the paucity of bacillary cases hitherto recorded is due to (*a*) many bacillary cases having been erroneously diagnosed as amoebic in origin; (*b*) owing to mildness of symptoms, many cases having been diagnosed as diarrhoea, colitis, etc., in lieu of dysentery.

2. These errors are due to (*a*) lack of recognition of the character and importance of the cellular exudate in bacillary dysentery, and the diagnosis of macrophage endothelial cells containing red blood cells as *E. histolytica*; (*b*) lack of co-operation between medical officers in charge of cases and laboratories.

3. As result, medical officers have believed most intestinal disorders to be due to *E. histolytica*, and emetine has thus played an unnecessarily prominent part in their treatment.

4. The remedy can be obtained by (*a*) increased co-operation between clinician and laboratory; (*b*) training medical officers in the preliminary precautions necessary to establish a correct diagnosis; (*c*) laboratory workers (comparatively unskilled) not accepting a cell as *E. histolytica*, from a case of *acute dysentery*, unless it contains red cells, and is actively motile; (*d*) the D.A.D.P. accepting no diagnosis from a subordinate until he has confirmed it himself.

H. M. H.

BONEY (Knowles). **Dysentery in Mesopotamia.** [Correspondence.]—*Brit. Med. Jl.* 1926. Feb. 13. p. 303.

The *B. M. J.*, in commenting on the "*Report on the Health of the Army, 1923,*" noted that it showed that nearly all the dysentery in

Iraq was amoebic, whereas in Egypt only 35 out of 64 cases were of that type, and that this bore out much of what had been previously recorded in connexion with the geographical distribution of amoebic and bacillary dysentery. The figures in the named Report were :—

	Total.	Amoebic.	Bacillary.
Iraq	207	181	?
Turkey	112	1	61
Egypt	64	35	29

Major Knowles Boney writes that in Iraq, during the War, of 250 consecutive acute dysenteries, in 51 per cent. the bacillus of dysentery was isolated ; 26 per cent. only were amoebic. He cites WENYON and LEDINGHAM in support of his own 5 years' bacteriological experience in Iraq that the dysentery there, during that time, was predominantly bacillary. He concludes that, "a great change must have come over the etiology of Mesopotamian dysentery." [As relevant comment see abstract, above, of Major MANIFOLD's paper.]

H. M. H.

McROBERT (G. R.). **The Abuse of Emetine.**—*Indian Med. Gaz.* 1925. Dec. Vol. 60. No. 12. pp. 563–565.

The author states that in India the practice of "in diarrhoea try the effect of emetine," is almost as common as that of "in fever try the effect of quinine." One may entirely agree with him that the first practice is even more disastrous in its results than the second. He insists that emetine should be given only when the intestinal trouble is caused by *E. histolytica*. This cannot be established except by microscopic examination of fresh stools. Though in rural areas of India, under present conditions, diagnosis by microscopic investigation must often be impossible, there is no excuse for its omission in urban, civil, or in military practice. Emetine is a highly toxic drug, especially for the cardiac muscle, and should never be given to ambulatory patients. He enumerates briefly some of the bad results he has observed and attributes them to the unwarranted or careless use of this drug, and ends with the minatory statement that "The sword of Damocles, in the shape of a civil suit for damages . . . may very shortly dangle over those in India who treat dysentery without microscopic control, and sooner or later the fall is bound to come."

This warning makes it all the more regrettable that full conviction of the truth of the author's thesis may not be carried to those of his readers with less experience of the harmfulness of the blind use of emetine ; and this because of his omission of definite data for his and their judgment. More studies in detail of this important matter are needed.]

H. M. H.

DICKENS (P. F.). **A Two Years' Study of Dysentery in Haiti.**—*U.S. Nav. Med. Bull.* 1925. Dec. Vol. 23. No. 6. pp. 452–465. With 13 figs.

The majority of cases of dysentery in Haiti are of bacillary origin (Shiga type). Dysentery is endemic, and at times severe epidemics occur. The diagnosis requires a careful physical examination of the patient. Amoebic dysentery, tuberculous colitis, syphilis of rectum and the dysenteric type of intestinal malaria may all confuse the

diagnosis. The Wasserman reaction helps but little, since 60 per cent. of the population give a positive serum reaction. Amoebic colitis is rare. Microscopical examination of the exudate from the bowel is the most reliable and most rapid method of diagnosing bacillary dysentery. The microscopical picture is characteristic—many pus cells and few red blood corpuscles. Endothelial cells, some vacuolated and so resembling amoebae, are present also. Arthritis was the most common complication encountered and occurred as often in those cases treated with salines alone as in the cases receiving serum. The poorly nourished and emaciated individual is prone to become infected. The spread of dysentery in institutions can be prevented by isolating patients; disinfecting all excreta, bedding and linen of patients; segregation of new arrivals for a period of eight days; daily disinfection of living quarters; allowing only healthy individuals to prepare or handle food for others; and by disinfecting latrines at regular and frequent intervals.

The best method of treating bacillary dysentery is by the combined use of an antiserum and salines, plus a good nutritious diet. The author believes that adding glucose to the dietary saved many of his cases.

H. M. H.

ESSED (W. F. R.). **Dysentery in the Toba-District.**—*Meded. Dienst. d. Volksgezondheid in Nederl.-Indië.* 1925. Pt. 3. pp. 324–342. With 1 map, 4 figs. & 6 charts. [3 refs.]

Bacillary dysentery did not reach the Toba plateau (Java) from the East Coast until 1920–21.

The author concludes, after his interesting research, that :—

1. Dysentery on the Toba plateau has two causes: (*a*) Amoebic, 13 per cent. of cases; and (*b*) bacillary. This last is due to Shiga-Kruse bacillus and is endemic.

2. The flying laboratory equipment was satisfactory: plates (Endo) could be made on the spot.

3. Balantidiasis was not found in man. It was found in pigs.

4. It is not necessary to treat the slight cases of Shiga dysentery with serum.

5. 57 per cent. of Shiga dysentery cases shown no fever: several cases had subnormal temperatures.

6. Isolation, and treatment, of dysentery patients proved efficient in lowering the endemical "apices." The medical service must keep an eye on these latter constantly.

7. Whereas the Shiga-Widal reaction is valueless for diagnosis at the sick-bed, it is, notwithstanding a few negative and doubtful results, very useful to the epidemiologist; especially so because isolation of Shiga bacillus from faeces fails in a great percentage of cases.

The author holds that cholera and typhoid form two extremes among "water-borne" diseases. Cholera occurs only epidemically, typhoid exclusively endemically. Typhoid "epidemics" are, in fact, but small rises of an "endemic": it is a more or less large number of strongly localized cases—barrack, hospital, school, army, where there is usually one source of infection. Between these two extremes are the bacillary dysenteries. Shiga dysentery is nearer to cholera, is more apt to cause epidemics, and seldom occurs sporadically. There are weak toxin formers, however, in dysentery [it is not clear if the author

refers still to Shiga dysentery], and these are nearer to typhoid. They cause endemics, sporadic cases, and are far less apt to give rise to epidemics. Their so-called epidemics are strictly localized to prisons, asylums, etc., and as a rule there is but one source of infection.

H. M. H.

LUCAS-CHAMPIONNIÈRE (M. S.). Séquelles chirurgicales des entérites dysentériformes. [**Surgical Sequelae of Dysentery.**]—*Bull. Soc. Path. Exot.* 1925. Dec. 9. Vol. 18. No. 10. pp. 825–828.

The author pleads for the systematic study of the opinions which he has somewhat indefinitely outlined in this ppaer, for which he does not claim the status of precise observations, but rather of impressions gained from his experiences in Dakar and Shanghai. Late effects of dysentery are bowel disturbances often due to chronic dilatation of the colon, sometimes to ptosis of the transverse colon or, it may be, to chronic subacute peritonitis; more or less of stricture of the bowel may be found also. He thinks post-dysenteric appendicitis not infrequent. Its characters, revealed by operation, are (1) a large congested dilated caecum; (2) peritoneal fibrosis, with great frequency of Jackson's membrane (rare in Europe); (3) seldom a free appendix; rarer still normal and supple meso-appendix; extreme frequency of adhesion of appendix to the caecal wall. He considers post-dysenteric lesions frequent causes of appendix infections.

H. M. H.

PANAYOTATOU (A.). Trois cas d'entérite à *Trichomonas* guéris par le stovarsol. [**Three Cases of Trichomonas Enteritis cured by Stovarsol.**]—*Bull. Soc. Path. Exot.* 1925. Oct. 14. Vol. 18. No. 8. pp. 647–651. [2 refs.]

At the Greek Hospital, Alexandria, 1915–1921, the author in 790 stool examinations found amoebae in 59 per cent., and in 21 per cent. Trichomonas. This parasite he considers to be undoubtedly a cause of serious and persistent diarrhoea, and in support quotes BRUMPT. He states that Trichomonas is absent from the stools of healthy subjects who have had no previous diarrhoea. He had examined stools from a large number of healthy subjects or from cases of diverse illnesses, not intestinal, and has never found the parasite. MARCHOUX having reported the disappearance from stools of the cysts of amoeba, lamblia and blastocystis, after stovarsol use, the author tried this drug on 3 cases of Trichomonas infection. No other protozoal parasites were found in their stools. Cessation of symptoms and complete disappearance of the parasite followed on 7 to 10 days treatment with stovarsol by mouth.

H. M. H.

NINO (F. L.). [A proposito de un nuevo caso de colitis balantidiana en la Republica Argentina.] **A New Case of Balantidial Colitis in the Argentine Republic.**]—*Prensa Med. Argentina.* 1925. Vol. 12. p. 114. With 4 figs. [Summarized in *Bull. Inst. Pasteur.* 1925. Oct. 31. Vol. 23. No. 20. p. 901.]

Clinical report of a case (the third known in the Argentine Republic) of balantidiasis. The patient, a woman, had never been away from La

Boca, or been in contact with pigs. She suffered from numerous muco-sanguineous stools, with fever showing evening exacerbations. Besides the *Balantidium coli*, she had also infection with *Trichomonas hominis* and *Ascaris lumbricoides*.

H. M. H.

RIMPAU. Das Vorkommen der uebertragbaren Darmkrankheiten —Unterleibstyphus, Paratyphus, Ruhr—in Südbayern in den Jahren 1913–1924. **Transmissible Intestinal Diseases in S. Bavaria in 1913-1924.**]—*Muench. Med. Woch.* 1925. Nov. 13. Vol. 72. No. 46. pp. 1964–1967. [3 refs.]

An epidemiological statistical review of these illnesses during the period 1913–1924.

H. M. H.

DONATH (Julius). Die Yatren-105-Therapie der Amöbenruhr. (Bemerkung zu C.B. Huppenbauers gleichnamigen Aufsatz in Nr. 43 dieser Wochenschrift.)—*Muench. Med. Woch.* 1925. Nov. 27. Vol. 72. No. 48. pp. 2064–2065.

KAWAMURA (Hideku) & TSUCHIYA (Kinichiro). [On the Standardization of Dysenteric Serum. Communication II. Standard and its Testing Method or Dysenteric Serum.]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1925. Feb. No. 348. [Summarized in *Japan Med. World.* 1925. Nov. 15. Vol. 5. No. 11. pp. 322–323.]

LA TERZA (Ermanno). Contributo alla terapia medica dell'ascesso epatico tropicale.—*Ann. di Med. Nav. e Colon.* 1925. Nov.–Dec. Year 31. Vol. 2. No. 5–6. pp. 319–326. [1 ref.]

TERZANI (Alberto). Dell' epatite amebica e della sua cura con l'emetina.—*Riv. di Clin. Med.* 1925. Sept. 15. Vol. 26. No. 17. pp. 617–631. [10 refs.]

TROPICAL DERMATOLOGY.

ALBERNAZ (Paulo Mangabeira). Considerações em torno do tratamento da "ulcera tropical." [**Treatment of Tropical Ulcers.**]—*Brazil Medico.* 1925. Sept. 5. Year 39. Vol. 2. No. 10. pp. 123–127. [64 refs.]

Various methods recommended for the treatment of "tropical ulcer" were applied by the author in the numerous cases under his care. Dusting with iodoform, applications of formol (40 per cent. formic aldehyde) and of its 10 per cent. solution, methylene blue 5 per cent. in water, chromic acid 10 per cent., oil of chenopodium in glycerine or almond oil, neosalvarsan, all locally employed, and also the last named intravenously, gave varying results, but the best effects were brought about by Bismoluol, the commercial name of "acid bismuth tartrate of potassium." The ulcer is irrigated with hot water, the excess of fluid mopped up with sterile gauze, and the Bismoluol in powder dusted on. Much pain is caused, but disappears in 2–4 hours, and in 24 hours the surface is covered with a gelatinous mass. In 48 hours healing begins and cicatrization is rapid.

H. Harold Scott.

TERDSCHANIAN (A.). Ein Fall von Ulcus tropicum, mit Neosalvarsaninjektionen und $CuSO_4$.-Lösung geheilt. [**Case of Tropical Ulcer healed by Neosalvarsan Injections and Copper Sulphate Solution.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Sept. 1. Vol. 29. No. 9. pp. 449–450. [3 refs.]

Report of a case in which the rapid healing of the sores is attributed to the local application of compresses of 10 per cent. copper sulphate solution, in association with 3 intravenous injections of neosalvarsan. The writer adds that he has obtained good results also with this solution in cases of ulcus molle.

W. Jenkins Oliver.

HIDAKA (Seiichi). **Keratoangioma punctatum symmetricum.**—*Jl. Oriental Med.* 1925. Mar. Vol. 3. No. 1. German summary pp. 30–31. With 3 figs. on 1 plate. [3 refs.] [In Japanese.]

Report concerning a peasant, aged 20 years, in whom the skin condition had been observed since early childhood. The greater part of the eruption was distributed symmetrically over the dorsal aspects of the hands and extensor surfaces of the wrists, with only a few scattered lesions on the distal parts of the forearms (both surfaces) and about the bases of the fingers on their dorsal aspects. The eruption consisted of numerous spots varying in size from milia to rice grains, sharply defined, slightly red in colour and hardly raised above the skin surface. They might be made to almost disappear by pressure, and only the larger lesions showed clinically slight hyperkeratosis. The microscopical picture did not present the same degree of hyperkeratosis or of capillary enlargement as is customary in angiokeratoma (Mibelli). The affection was stationary and caused no subjective symptoms. The patient appeared to be otherwise healthy.

W. J. O.

HIDAKA (Seiichi). Ueber eine eigentuemliche Porokeratose: Porokeratosis vera. [**A Peculiar Form of Porokeratosis.**]—*Jl. Oriental Med.* 1925. Mar. Vol. 3. No. 1. German summary pp. 27–29. With 1 text fig. & 6 figs. on 2 plates. [8 refs.] [In Japanese.]

Report of a case showing horny plugs localized to the sweat duct orifices, occurring in a girl, aged 13 years, with diffuse scleroderma. The lesions, consisting of discrete flat or slightly raised miliary red papules, were distributed irregularly over the dorsal aspects and edges of both hands, the fingers, interdigital clefts and on both surfaces of the lower third of each forearm. A few isolated similar lesions were present on the palms and on the dorsal aspects of the feet. The horny central plugs, situated on the top of the papules and to be extracted with difficulty to leave small depressions were made up of numerous concentrically-arranged layers of cells. The hair follicles were entirely unaffected. Clinically, the appearance was that of Keratoderma punctatum symmetricum. The histological picture showed a mass of horny parakeratotic cells in lamellar arrangement, localized to the sweat duct pores, surrounded by flat epidermal cells containing keratohyalin granules. There was no increase of skin pigment and no cellular infiltration of the corium. The condition, therefore, must be distinguished from porokeratosis Mibelli.

W. J. O.

LEBER (Alfred). Ueber den Pemphigus tropicus contagiosus und seine therapeutische Beeinflussbarkeit mit Stibenyl. [**Treatment of Pemphigus tropicus contagiosus by Stibenyl.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 203–207. With 2 figs. on 1 plate.

The irregular occurrence of the *Staphylococcus aureus* in the bullous lesions is against the assumption that this organism is the causative factor of the affection. A case is reported from Java concerning a planter in whom the disease had commenced on the left hand following, in his own opinion, infection from a dirty bridle. The general depression of the patient contradicted the supposition of a purely local infection. In addition to the lesions on the arm, there were bullae on the conjunctivae and on the forepart of the tongue. Examination of the contents of these lesions gave negative morphological and cultural results. The beneficial general effect of stibenyl observed in a previous case of ocular pemphigus suggested the trial of this drug in the case under examination. Two intravenous injections of 0·1 gm. and 0·3 gm. respectively of stibenyl, given on successive days, produced complete healing of the lesion in eight days, the tongue lesions being the last to show improvement. Only after the local lesions had healed was the subjective feeling of illness ameliorated.

W. J. O.

DOSTROWSKY (Arieh). Zum Wesen der "Harara." [**The Nature of "Harara."**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Sept. 1. Vol. 29. No. 9. pp. 443–449.

Is there one disease to be recognised as a clinical entity among the numerous skin diseases designated *Harara* (denoting heat) by the laity of Palestine? The writer would answer this question in the affirmative. The condition is most frequently seen among the newcomers to the country and chiefly in the summer months, May to September. It is observed to the greatest extent on the distal parts

of the extremities on their dorsal aspects, being more sparsely distributed on the proximal parts, face, neck and upper part of the chest, the remainder of the body being uninvolved. The original lesions of varying size resemble those of strophulus, sometimes showing a vesicle with a red halo, but all the lesions rapidly become altered through scratching to give the appearance of impetigo or pyoderma. The vesicles contain numbers of eosinophile cells and are both microscopically and culturally sterile. A certain degree of immunity is apparently produced as only a few cases suffer in succeeding years: for this reason, perhaps, the disease is seen comparatively rarely among the adult settled population. The condition is to be regarded as an urticaria peculiar to warm countries. Two etiological factors suggest themselves: (1) The summer heat combined with the large number of sun rays; and (2) the numerous subtropical insects. The localization of the lesions more particularly suggests the bite of insects during sleep as the probable causative factor, and of such insects a Phlebotomus appears to be the most likely concerned.

W. J. O.

GUPTA (A.). **"Ecthyma" as a Menace against Small-Pox Vaccination.** —*Calcutta Med. Jl.* 1925. May. Vol. 20. No. 11. pp. 432–434.

This short article draws attention to an ecthymatous condition of the skin occurring frequently in Calcutta among infants and young children, associated with dirt and malnutrition, which skin affection precludes many cases from seeking vaccination. The general condition of such children must be treated and an iron tonic is advised. Local treatment consists in the application of a weak (1–2 per cent.) mercurial ointment or paste after removal of all crusts by fomentations, and by applying the following lotion, Zinci Sulphat. gr. iii, Cupri Sulphat. gr. ii, Aquae Camphorae (in distilled water) 1 oz.

W. J. O.

DELBANCO (Ernst). Zur Fox-Fordyceschen Krankheit. [**Fox-Fordyce Disease.** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 538–546. With 3 text figs. [13 refs.]

A review of the literature concerning this affection draws attention to FISCHER's observation that no case has been recorded before the age of puberty, while practically all cases have occurred in women between the ages of 13–50 years. Two female cases are briefly reported. The discrete papular lesions are described with the grater-like appearance of the skin of the axillae, the loss of hair and the accompanying intolerable itching. The writer is in apparent agreement with FISCHER that the disease is an affection of the apocrine (holocrine) sweat glands of Schiefferdecker, which are described. Though the pathogenesis of this condition is not clear, the histological picture shows a blocking of the duct orifices and hair follicles by the altered epidermis and by the periglandular and perifollicular cellular infiltrations. The interdependence of the epidermal changes and the secretion (perhaps defective) of the physiologically active glands remains undetermined, while such factors together with a possibly toxic action of the secretion, retained within the blocked ducts, all combine to set up an apparent vicious circle.

W. J. O.

SCANLON (R. W.). **Accidental "Marking-Nut" Dermatitis.**—*Indian Med. Gaz.* 1925. Oct. Vol. 60. No. 10. p. 480.

Report of a case of dermatitis artefacta showing scattered papules and vesicles on the chest, probably from splashing, and an herpetiform vesicular eruption on the left arm from direct contact, commencing 4 days after a therapeutic application of the juice of the marking-nut to the scalp for ringworm.

W. J. O.

PANJA (Ganapati). **Lichen Spinulosus.**—*Indian Med. Gaz.* 1925. Oct. Vol. 60. No. 10. pp. 467–468. With 2 text figs.

The author reports that he has observed four cases of this skin condition and claims to have found fungi of the tinea group in scrapings from all the cases. [The diagram presented to show the appearance of the fungus elements is hardly convincing.]

W. J. O.

CHALON (G.). Un cas de maladie de Recklinghausen observé chez un arabe de l'annexe d'Ouargla (Sahara Constantinois). [**A Case of Recklinghausen's Disease seen in a Ouargla Arab.**]—*Arch. Inst. Pasteur d'Algérie.* 1925. Mar. Vol. 3. No. 1. pp. 22–27. With 2 text figs. [2 refs.]

Report concerning an Arab, aged 60 years, in whom the condition appeared to have been congenital. The tumours, mostly pedunculated, in size varying from a pin's head to a large pea, were generalized over the whole trunk, arms, face and scalp without any systematization or metamerization. Fewer lesions were present on the legs, while the palms and soles were free. Two large tumours, one pedunculated of the size of a fist and one sessile of the size of a mandarin orange, were situated about the left lumbar and left trochanteric regions respectively. According to the patient's statement all the tumours had ceased to grow for some years though none had disappeared. No tumours were palpably associated with any superficial nerves. Numerous chocolate brown macules were scattered irregularly and more especially over the trunk and upper limbs. There was no apparent alteration in the colour of the mucous membranes, no apparent deformity of the bones and no appreciable endocrine disturbance. Histological examination confirmed the diagnosis.

[The case is peculiar if the congenital origin of the tumours is to be believed.]

W. J. O.

RAU (P. Bhaskara). **A Simple Cure for Leucoderma.**—*Indian Med. Gaz.* 1925. Dec. Vol. 60. No. 12. pp. 578–579.

The writer has employed with success on two patches of leucoderma occurring on his own face and forearm the Ayurvedic prescription of yellow orpiment 1 part and seeds of *Psoralia corylifolia* 4 parts. These drugs are mixed together and finely powdered and cow's urine or pure drinking water is added in sufficient quantity to make a thick paste which is applied frequently to the depigmented areas. Under this treatment the patches completely disappeared in 14 days. The

native names of the seeds are mentioned. A note by the editor gives the better known name of *Bouchi* seed.

W. J. O.

PAROUNAGIAN (Mihran B.). **Psoriasis in a Full-Blooded Negro.**—*Arch. Dermat. & Syph.* 1926. Jan. Vol. 13. No. 1. pp. 106–110. With 3 text figs. [9 refs.]

Case report of an American negro, aged 42, with a previous history of syphilis and with a positive Wassermann reaction, showing an extremely pruritic generalized squamous eruption with the lesions most marked on the extensor surfaces of the limbs and on the scalp and face. The clinical diagnosis of psoriasis was confirmed histologically. The condition cleared under an ammoniated mercury and tar ointment to recur within two months. A review of the literature concerning the occurrence of psoriasis in negroes is added.

W. J. O.

MAASS (Edgar). Beobachtungen ueber Ainhum. [**Observations on Ainhum.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Jan. 8. Vol. 30. No. 1. pp. 32–34. With 1 text fig.

Attention is drawn to the frequent familial occurrence of the disease, which affects as a rule the fifth toe, commencing on the plantar surface and between the toes. Some chronic inflammation probably paves the way, while there may be a peculiar tendency towards contractile scar formation in contrast to the propensity to keloid production so frequent among negroes. A case is reported in which both fourth toes were simultaneously affected. Amputation being refused, a deep longitudinal incision through the constricting bands improved the condition considerably.

W. J. O.

KENYA MEDICAL JOURNAL. 1925. June. Vol. 2. No. 3. pp. 88–89.—**East African Scabies.** [C. J. W.]

This short commentary is a plea for the determination of the causal parasite of the "commonly-named" scabies occurring in East African natives, and for the prescription of a routine line of treatment. The identification of the mite isolated from cases of West African craw-craw and described as indistinguishable morphologically from *Sarcoptes scabiei* is noted.

W. J. O.

1. MOUCHET (M.). Hydarthrose du genou gauche, voile apical droit; placards dyschromiques et analgésiques; absence du bacille de Hansen dans le mucus nasal et le suc ganglionnaire. [**Hydrarthrosis of Left Knee; Apical Shadow on Right Side; Discoloured and Analgesic Plaques; Hansen's Bacillus absent from Nasal Mucus and the Gland Juice.** *Bull. Soc. Path. Exot.* 1925. July 8. Vol. 18. No. 7. pp. 527–528.

ii. DELAMARE (G.) & ACHITOUV. Hyperkératose folliculaire ; hypochromie et atrophie épidermiques ; infiltration lymphoïde périfolliculaire et périvasculaire sans cellules géantes ; pas de bacilles acidorésistants ; microfilaires. [**Follicular Hyperkeratosis ; Epidermal Hypochromia and Atrophy ; Perifollicular and Perivascular Lymphoid Infiltration without Giant Cells ; Absence of Acid-fast Bacilli ; Microfilariae present.**]—*Ibid.* pp. 529–531.

i. Case report of a soldier whose clinical condition is summarized in the title of this short note. The skin lesions consisted of well-defined round or oval discoloured patches with a raised festooned border, without any palpable thickening, situated on the anterolateral and posterior surfaces of the body and on the postero-external aspect of the right arm.

ii. The histological picture of a portion of one of the skin lesions (from the arm) described in the above report is the subject of this communication, the title of which summarizes the main histological features. In addition the arterioles showed slight thickening of the external coat and the veins some occasional meso- and peri-phlebitis. The lymphatic channels were dilated and showed occasional partial obliteration of the lumen by endothelial overgrowth. The nerves appeared normal. Numerous microfilariae were observed in the subpapillary connective tissue, occurring singly or in groups of 2–4, about, but never within, the infiltrated lymphoid cellular masses, and entirely absent from the hypoderm. There was no evidence of leprosy. While the patchy discoloured lesions somewhat resembled the circumscribed dermatosis observed in dracontiasis, the absence of any local eosinophilia and the location of the microfilariae were factors against the hypothesis of a parasitic dermatitis. It is suggested that other cases of tuberculides and leprides among natives should be examined for the presence of microfilariae, and dermatoses associated with filariae searched for Koch's and Hansen's bacilli.

W. J. O.

LEVY (D. M.). Een geval van "Creeping disease." [**A Case of Creeping Disease.**]—*Nederl. Tijdschr. v. Geneesk.* 1925. July 25. 69th Year. 2nd Half. No. 4. pp. 479–481. With 1 plate.

Description of a case in a female child aged 2½ who, during her return from Netherlands India, developed a red spot in the right gluteal region, which crept onward at a rate of 3 cm. in 8 days, in a line with numerous windings, and left a red trace which gradually grew paler at the opposite end. There was much itching at the growing end. After this end was extirpated complete recovery occurred. In the extirpated tissue no parasite was found, although a burrow in the stratum granulosum seemed to indicate that it had been there.

An account of the habits of oestrid larvae ends the article.

N. H. Swellengrebel.

SCHAEFFER (W. F. Facee). Is de gastrophilus larve de verwekker van de Creeping Disease ? [**Is the Larva of Gastrophilus the Cause of Creeping Disease ?**]—*Nederl. Tijdschr. v. Geneesk.* 1925. Sept. 5. 69th Year. 2nd Half. No. 10. pp. 1115–1117.

Record of a case of creeping disease in a 3 years' old child in Balik Papan (Borneo), observed from the very first moment. The typical

meandering red line started from a much itching vesicle on the right sole. An attempt was made to dislodge the supposed parasite by local refrigeration of the skin with ethyl chloride. In this way an acarine was recovered, which unfortunately was lost before it could be identified. After this the red line still continued to grow for a length of 1 cm. (the usual daily growth varying between 1–7 cm). Then it stopped, and recovery set in without any other treatment.

N. H. Swellengrebel.

MORISHITA (Kaoru) & FAUST (Ernest Carroll). **Two New Cases of Human Creeping Disease (Gnathostomiasis) in China, with a Note on the Infection in Reservoir Hosts in the China Area.** - *Jl. Parasit.* 1925. Mar. Vol. 11. No. 3. pp. 158–162. With 2 plates. [11 refs.]

The authors record two new cases of creeping disease in man due to immature nematodes which they believe to be *Gnathostoma spinigerum*. This brings the total number of cases in man to seven—one due to *G. hispidum* (normally parasitic in pigs) and six to *G. spinigerum* (normally found in Carnivores).

T. W. M. Cameron.

KIRBY-SMITH (J. L.). **A Consideration of Creeping Eruption in the Southern States with an Entomological Report.**—*Southern Med. Jl.* 1925. June. Vol. 18. No. 6. pp. 402–409. With 4 text figs. [41 refs.]

During 14 years' practice as a dermatologist the author has had opportunity of seeing not less than 2,500 cases of creeping eruption, which is common in the south-eastern States of America during the rainy season. Its cause, notwithstanding much investigation, "remains unsolved." The cause, whatever it be, requires air, since in situations where a vacuum could be maintained for an hour or more the author was able in several instances to stop the eruption permanently; moreover, the local application of ethyl acetate (as recommended by BISHOPP) under rubber tissue, or the plentiful application of collodion, brings about its disappearance in 24 hours.

The entomologist's report—after a reference to certain well-known reported cases from which fly larvae, variously identified as "Gastrophilus" or Hypoderma, or as *Wohlfahrtia vigil*, have been recovered—deals with a special investigation of more than 300 cases. At least 95 per cent. of them had a history of contact with damp sand, so that the "damp sand type of creeping eruption" is suggested as a fitting popular name for the condition as encountered in Florida. In 50 per cent. of the cases the damp sand was that above high water mark, where children play; other cases—and the most severe—were in plumbers laying pipes in moist sand. The most careful search has not, so far, revealed a parasite, though some sections of skin have still to be examined. It is thought, however, that the parasite may be identical with a worm 9 millim. long and 1 millim. broad removed from a linear papule by MOOD, of S. Carolina. The description of that worm "is said to have corresponded to that given by Tamura in which a similar parasite was identified as *Gnathostoma siamense*." [Gnathostoma is a synonym of a genus of Nematode worms.]

In the discussion on the paper the commonness of the eruption in the south-eastern States was generally confirmed and several speakers corroborated the history of its origin in damp sand or damp and polluted soil. Among the remedies confidently recommended, besides ethyl acetate, were freezing with hydrochloric ether, beating followed by application of collodion, and high frequency sparking along the track of the parasite.

A. Alcock.

CORRIGAN (S. Harvey) & CORRIGAN (Cecil Edwin). **Three Cases of Creeping Myiasis in Saskatchewan.**—*Canadian Med. Assoc. Jl.* 1925. Apr. Vol. 15. No. 4. pp. 403–404. With 1 text fig.

The three cases occurred in men working with horses. The patients complained only of local irritation. Only in one case was a maggot found, and it was identified, by Professor CAMERON, of the Zoology Department of the University of Saskatchewan, as either first or second stage of *Gastrophilus intestinalis*.

A. A.

BLANCHARD & LAIGRET. Deux cas de "larbisch" observés sur des Européens à Brazzazille. **Two Cases of "Larbish" in Europeans at Brazzaville.**]—*Ann. de Méd. et de Pharm. Colon.* 1924. Sept.—Oct. —Nov.—Dec. Vol. 22. No. 3. pp. 414–415.

Two more cases of "creeping pseudomyiasis" in which no cause could be discovered.

A. A.

POMEROY (J. K.). **Case of Larva Migrans.** *Canadian Med. Assoc. Jl.* 1925. Dec. Vol. 15. No. 12. p. 1249. With 1 text fig.

The patient in this case was accustomed to lie prone when weeding her garden, and the inflammatory wheal meandered about the navel Ethyl chloride "apparently killed the larva"—which, however, escaped detection.

A. A.

GAMMEL (J. A.), MISKDJIAN (Hagope) & THATCHER (Harvey S.). **Madura Foot (Mycetoma). The Black Grain Variety in a Native American.**—*Arch. Dermat. & Syph.* 1926. Jan. Vol. 13. No. 1. pp. 66–76. With 6 text figs. [14 refs.]

Case report concerning a Mexican, aged 26 years, accustomed to go barefooted when engaged in farm work, in whom, 5 years previous to his coming under observation, the disease had commenced as "a limited swelling in the middle of the plantar surface of the left foot." Only during the last few months had the swelling spread to affect also the dorsal aspect of the foot. Small black spots were found on the sole from which black grains could be expressed. Radiological examination revealed no bone involvement. Histologically the granuloma showed the majority of the granules, with three differently pigmented zones, to be situated in the deeper layers of the corium. There was some slight atrophy of the sweat glands. In making the biopsy no involvement of the muscles was observed. The biological and cultural characters of the organism are briefly noted. Concerning the latter "the most striking feature is the formation of brown pigment

on carbohydrate mediums." The fungus was identified as belonging to the genus *Madurella* (Brumpt), while the species did not resemble any previously described, and was therefore designated *Madurella americana*. Inoculation experiments into animals were all negative.

W. J. O.

FRAZIER (Chester N.). **Hongkong Foot.**—*China Med. Jl.* 1925. Aug. Vol. 39. No. 8. pp. 705–711. [18 refs.]

The disease is a mycotic infection of the feet occurring especially in the summer months and appears: (1) As deep-seated vesicles about the inner margin of the hollow of the sole, and on or between the toes at their proximal extremities; (2) as a macerated condition of the skin of the interdigital clefts and of the contiguous surface area. A persistent and intolerable itching is a marked feature. The nails may show infection, as also may the hands. While no systematic study of the moulds has been made, DOLD, in 1919, identified the fungus from 14 cases as resembling the *Epidermophyton inguinale* (Sabouraud). The application of a formaldehyde salicylic acid lotion 2–3 times weekly is advocated as a preventive measure:—

Liq. formaldehyde (40 per cent.)	3–6
Ac. salicylic	3–6
Alcohol (sufficient to make a solution) ...	30
Water	30

For treatment, Whitfield's ointment is recommended.

W. J. O.

CHAVARRÍA (A. Peña) & SHIPLEY (Paul G.). Beitrag zur Kenntnis der "Carate"-Arten des tropischen Amerika. [**Carate of Tropical America and its Varieties.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Oct. 15. Vol. 29. No. 10. pp. 605–609.

A review giving a very comprehensive survey of the disease. The authors dispute the occurrence of fever and diarrhoea in the early stages of the affection. Eosinophilia (10–12 per cent.) is a constant feature even in the absence of worms. While the spores may be introduced mechanically by any biting insect the occurrence of the disease is striking in those districts where Simuliidae are in particular preponderance. The cultural characteristics of the fungi (excepting from cases of blue carate) are briefly mentioned. All these moulds are peculiarly resistant to the action of ultraviolet rays which may thus be employed to disinfect the skin before undertaking any cultural investigation of the scales. In contrast to other dermatomycoses the horny layers of the epidermis are free of fungus. Early cases are best treated by the external application of tincture of iodine, older cases by intravenous injection of arsenobenzol and oral administration of arsenic together with external cleaning by soap and water and the application of a 2 per cent. calomel + 1 per cent. salicylic acid ointment.

W. J. O.

VILLAIN (G.). Le tokelau (*Tinea imbricata*) dans la province chinoise du Honan. **Tokelau in the Province of Honan, China.**—*Bull. Soc. Path. Exot.* 1925. Oct. 14. Vol. 18. No. 8. pp. 618–622. With 1 text fig. [5 refs.]

Case report concerning a man showing the affection, of 3 years' duration, mainly on the gluteal region, with a few concentric ringed scaly lesions

on the arms. Microscopical examination of the scales showed a fungus resembling the Endodermophyton. The case is of interest in its geographical occurrence.

W. J. O.

CASTELLANI (Aldo). **Further Observations on Pruritus Ani and Pruritus Vulvae of Mycotic Origin.** - *Jl. Trop. Med. & Hyg.* 1925. Sept. 15. Vol. 28. No. 18. pp. 329–332. [3 refs.]

Over 20 per cent. of the author's cases systematically examined since 1912 have shown the presence of fungi, mostly of the *Epidermophyton* genus; occasionally a *Trichophyton* has been found. *Monilia* occurs probably as a secondary contamination. Minute, red, raised, slightly infiltrated patches of skin suggest a mycotic infection, especially with an accompanying history of tinea cruris or pedum. Any associated eczematous condition renders the treatment difficult, uncomplicated cases being most successfully treated with Deek's ointment or with sulphur praecipitata and salicylic acid aa.gr. 15–20 in 1 ounce of vaseline.

W. J. O.

REVIEWS AND NOTICES.

LEAGUE OF NATIONS. **Health Organisation. Malaria Commission. Report on its Tour of Investigation in Certain European Countries in 1924.**—195 pp. With 2 maps, 20 figs. & 4 charts. C.H. 273. Geneva: 1925. Mar. 26.

The members of the Health Committee of the League of Nations, together with experts, correspondents and secretaries, toured, during 1924, in the Kingdom of the Serbs, Croats and Slovenes, in Greece, Bulgaria, Roumania, Russia and Italy. They have issued their summarized impressions of the tour, and detailed reports, from one to four, on each country visited.

Malaria, it is emphasized, is becoming recognized as a social disease, influenced for good or ill by proved measures of social hygiene—notably by good housing and feeding. So definitely is this so that the major bonifications of Italy are not considered as essentially antilarval in their effects—for quite cursory examinations of drainage canals shows the frequent presence of larvae—but as benefiting the country through the intensive use of the new, rich land, through better feeding, that is, and better housing; for, although perhaps it is not generally recognized, bonification is not held complete by the Italians until, to the immediate and intensive culture of the reclaimed lands, is added sanitary housing.

The question of the house is indeed held in this report to be of quite primary importance. It is there that infection is nearly always acquired, and there that the anopheles must be attacked. Screening is not advised until those for whom it is provided can be relied upon to use and not abuse it; but the "overwhelming importance of destroying domestic mosquitoes" is urged, the procedure being cited as probably "the simplest, most direct and perhaps also the easiest and least costly method" of attack, but one for whose success "the force of an enlightened public opinion is a necessity." Spraying, fumigation, hand-trapping and swatting are suggested, and indeed the primitive destructiveness of children has been enrolled in popularizing the last.

Following the inspiration of the Punjab, epidemic is sharply distinguished from endemic malaria; and in the production of epidemicity the interchange of strains of plasmodia is held to be a factor of primary importance and one not hitherto sufficiently stressed. This interchange of strains has been produced by civilian mass movements, such as the influx of refugees into Thrace and Macedonia, the vast movements induced by famine and pestilence in Russia in 1921–1922, and, of course, by soldiers returning after the Great War.

In view of the extent to which treatment has to be delegated to lay and subordinate personnel, the Commission advises that each country should select and recommend a suitable "Standard Treatment," mainly, perhaps, as an intimation of the necessity for continued treatment. For children, 2* cgm. per kilo. per day is suggested. Regarding antilarval measures the futility is expressed of dealing expensively with large bodies of water, while the minor collections, often more dangerous, are neglected. But, lest it be thought that large engineering schemes are deprecated, the Commission's deliberate pronouncement is that these are required in many areas to get the best out of the country, and to improve comfort and economic status; but that since they cannot be expected of themselves to effect an immediate change in malarial incidence, they must in general wait on finance.

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* In the English Version the figure given is 20. In the French the word "deux" is used which is obviously correct.

Clayton Lane.

BONNE (C.) & BONNE-WEPSTER (J.). [Edited with the Assistance of: "De Vereeniging tot bevordering der geneeskundige Wetenschappen in Nederlandsch-Indië."] **Mosquitoes of Surinam. A Study of Neotropical Mosquitoes.**—*Koninklijke Vereeniging het Koloniaal Instituut te Amsterdam. Meded. No. 21. Afdeeling Trop. Hyg.* No. 13. 558 pp. With 84 figs. 1925. Uitgave van het Instituut, Druk De Bussy, Amsterdam. [Price f.10, or $4.]

This useful work embraces not only the Culicinae (i.e., the true mosquitoes with elongate beak) of Surinam, but also those known to exist in other parts of tropical America, including the Antilles, but excluding Mexico.

The authors adopt the DYAR and KNAB classification, based mainly on the structural characters of the hypopygium of the male and on characters shown in the larval stage. They recognize, however, that this scheme has its weak points. Above all, they do not make the common mistake of running a good thing to wasteful and ridiculous excess, but realize that this particular male organ has not the invariable exactitude of a specific geometrical figure, and that too much fuss may be made of the little individual differences that may occur in it. Again, they recognize that tables of genera and species constructed for the use of specialists dealing with large collections, and having leisure for making suitable preparations of a discriminative organ of the male, may not be very convenient for the ordinary man who, nine cases out of ten, catches the obtrusive and aggressive female; and so, where necessary, they supply alternative tables, based on obvious superficial differences, for the identification of genera and species. Their specific descriptions are concise and where possible include the adult of both sexes, the larva, the pupa, and the egg, and also the breeding-places; but, of course, this entire completeness is not always possible. As a minor, but significant, point, although—along with a full description of the yellow fever mosquito and some pertinent remarks on its habits, etc.—they render to this insect the appropriate scientific name, *Aëdes* (*Stegomyia*) *aegypti*, they are perfectly tolerant of its other name, "largely used in medical and popular literature," *Stegomyia fasciata*.

A. Alcock.

FOX (Carroll). [M.D., Surgeon, U.S. Public Health Service, etc.] **Insects and Disease of Man.**—pp. xii+349. With 92 illustrations. 1925. London: H. K. Lewis & Co. Ltd. [Price 18s. net.]

It is difficult to criticize this compilation, since it is difficult to realize for what class of readers, or learners, or workers it is intended.

Although its title-page does not indicate the fact, it is unquestionably a treatise on Medical Entomology, since 220 of its 328 pages are definitely arranged in 22 chapters under that main heading, the preface states its alternative object to be the selection of the material required by the student of that subject, and its opening paragraph defines its scope as medical entomology without any qualification.

Now it must be admitted that the term "medical entomology" is not a very good one, owing, no doubt, to the fact that the term "medical" is itself a loose one, being applied now to the science and art, now to the students and practitioners of the art, now to the field of treatment, and now to the equipment used in treatment. Still, the term medical entomology is sanctioned by use, and everyone now knows what ought to be included under it; and no medical man at the present time can be expected to be satisfied with a survey of medical entomology which takes no notice of a multitude of venomous arthropods, and no notice of the insect fauna of provisions and store-houses, of waterworks, of sewage, septic tanks, etc., all of which—besides, in tropical countries, the insect fauna of habitations, etc.—are likely at any moment to engage the attention of the medical officer who has public health duties, whether in the military or

civil services, particularly if, as so often is the case, he be isolated and thrown upon his own resources.

The present volume restricts its vision to four orders of insects—flies, fleas, bugs, and lice—and one order of Arachnida—the mites and ticks,—and to the diseases for which they severally are responsible; it notices the domestic cockroaches, and glances at Cyclops in one of its pathogenous aspects; and takes its limited survey from two distinct points of view, first the entomological, and then the pathogenous or "medical."

The entomological results show an astonishing lack of proportion and discretion, descriptive matter of poor and often trivial elementary quality alternating with prodigious synoptical tables of genera and species which no one but a specialist in the particular group could utilize, or, perhaps, with a technical description of the details of structure of the Muscid head which no one but a dipterist could apprehend. When one finds 37 feeble lines given to the tsetse-flies, 11 lines to Dermatobia, and 6 lines each to Cordylobia and Auchmeromyia, and then turns to 5 pages of small type occupied by a key to the genera and species of North American blue-bottles, 9½ similar pages to a key to the genera of fleas, and 4½ similar pages to a key to the species of Sarcophaga occurring in the U.S.A.—these being flies that even the long-experienced dipterist finds insuperable difficulties in distinguishing from one another—one may be pardoned for expressing the opinion that it is the inessential that predominates in this—the main—part of the book, if it be intended for the use of medical men.

Some of the general statements are marvels of inept inexactitude, *e.g.*, that the members of the Arthropod phylum are "invertebrates having paired jointed appendages to the segments of the head, thorax, and sometimes the abdomen"; or of puerile insignificance, *e.g.*, that in the Class Insecta, "there is no osseous system," "there is no lung or gill." Surely, there needs no medical entomology to teach us that Queen Mab's whip of cricket's bone is but poetic fancy.

The medical part of the book is of far better quality, the author evidently being here on surer ground. One considerable mis-statement must be noticed, namely, that only two species of Glossina, namely, *palpalis* and *morsitans*, are concerned in African trypanosomiasis, and one considerable omission, namely, the history of the ribbon-worm in Cyclops and Diaptomus. And surely both Leishmania and Porocephalus should have come in somewhere in the volume.

The book must be allowed to be well printed and well got up, and to have some good illustrations.

A. Alcock.

ROBINSON (L. E.). [Ph.D. (Cantab.), A.R.C.Sc. (Lond.).] **The Genus Amblyomma. Being Part IV commencing Vol. II of Ticks: A Monograph of the Ixodoidea** by NUTTALL (George H. F.), WARBURTON (C.) & ROBINSON (L. E.).—pp. xii+302. With 7 plates & 130 figs. 1926. Cambridge: University Press. [Price 20s. net.]

This fine monograph deals in a masterly manner with the largest and one of the most widely distributed of all the genera of ticks. As the very instructive Introduction informs us, about half its species are American, and the rest are distributed in Africa, Asia, Australia, and the islands of the Pacific, a single outlying species occurring in Europe (Spain)—the whole being embraced within the 40th parallels of latitude. The range of hosts is also remarkably extensive, including Amphibia (a toad), Reptilia (lizards, snakes and tortoises), Birds—which are attractive to the larvae and nymphs rather than to the adults—and most orders of land Mammals, but particularly Ungulates. A unique instance has been recorded by NEUMANN of an *Amblyomma variegatum* attached to a slug. The genus is of some considerable importance to the veterinary profession, particularly in Africa, but is not so far as man is concerned of much

pathogenous import; *A. maculatum* is said to be one of the transmitters of the virus of Rocky Mountain Fever, and the larvae of *A. cajennense* are said to be, at certain seasons, in tropical America and the West Indies, a troublesome pest—as, indeed, Ixodid larvae of all kinds are in tropical countries. On the other hand, the author quotes an interesting use that the Indians of Rio Negro make of *A. maculatum* as an application to an inflamed corn, in place of a leech.

The descriptions of the species are models of comprehensiveness, conciseness, and point. In each instance—except in the rare cases where available material is deficient—there is a pungent diagnosis and a critical description of both male and female, and a compact statement of the geographical distribution and hosts, to which is added in a sufficient majority of instances a group of figures illustrating the distinctive features of the species. Besides these adroit descriptions and text-figures, the student has to guide him workmanlike analytical keys to the species, in both sexes, and also some beautiful plates. In supplement there are a classified list of hosts, a tabular statement of the geographical distribution of the species, a bibliography, and some useful and discreet notes on biology, which last are a striking contrast to the bald disjointed chat so often found in monographs upon those villainous forms of life that come betwixt the wind and man's fortunes. These notes on biology are placed, rather unfortunately, after the index.

A. Alcock.